



COAL AGE



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Coal Mining, Politics and Labor

THE campaign for the election of the Nation's President is now in full swing. Military preparedness and national defense seemingly overshadow all other issues.

The fundamental differences between political parties seem to have been eliminated, and there is no great disparity between their platforms. The party now in power has evidently recognized that with our high wage conditions a protective tariff is an absolute necessity for the survival of our industries, and the American people will have an opportunity to select their President this fall because of their belief in his personal fitness for the position, instead of his alliance with a partisan platform.

Unfortunately, the average American business man does not take much interest in politics, largely perhaps because of the many industrial problems that occupy his entire time and attention. Nevertheless, even the least observing must have noticed the great change that has slowly but surely developed within the last 15 years. Formerly the farmers' vote was the greatest single representation, but lately the strength of the labor vote has increased rapidly and the mine workers have become particularly active in affairs political. They now have a great number of members in the State Legislatures, and a former leader is now Secretary of Labor in the President's Cabinet. On the other hand, the representatives of the mining companies have made no progress in this direction.

Organized labor, through the various ramifications of the Federation of Labor acting in one accord, has become the most powerful political factor in this country. The Clayton Bill, which permits laborers and farmers to cooperate and organize for their mutual protection, and the Sherman Bill, which makes combinations of capital illegal and subjects offending parties to serious penalties including imprisonment, indicate a condition that is deserving of the most serious attention of mining men.

Political candidates and stump speakers in former days indulged in references to the "invisible government," and while there was always much mystery connected with the best meaning of the term, it invariably referred to combinations of capital. In recent years this reference has been omitted, because it is too well known that the "invisible government" rests with organized labor much more than with capital and the industries.

The general tendency of the world is toward democracy, but there is a great difference between democracy

THIS article was written by Carl Scholz, president of the Rock Island Coal Mining Co. He deals with a subject vital to industrial life, and we trust his remarks will bring forth valuable discussion from mine operators and labor leaders who know the present situation.—Editor.

such as is needed in the conduct of world affairs and socialism as generally advocated by labor leaders. Quite recently, in a wage conference, a prominent labor leader stated that the miners wanted to get their proportion of the salaries drawn by the officials of the coal companies. Would it not be just as logical to argue that the generals in an army should be paid no more than the privates?

In this land of opportunity we all start with the same advantages, and I take it that most mine managers and superintendents were situated like myself and have obtained their advancement and position

because they were able to demonstrate their ability to earn it. The law of demand and supply will continue to regulate this phase of human nature, and no power of organized labor can abate it or control it. Labor cannot exist without capital, and capital needs labor. Capital must recognize the needs of labor, likewise labor must become cognizant of the fact that capital must get a fair day's work in return for a fair day's wage. The growing tendency to exact impossible conditions, to impose hardships that do not benefit the rank and file but may distinctly harm them, though they may aggrandize the leaders, are features that cannot continue indefinitely. In many cases the old adage that "you cannot get blood out of a turnip" can be used with propriety.

Every man engaged in industrial work and occupying the position of an official is by labor classed as a representative of capital, although in a strict sense these leaders are mediators between capital and labor. These men have a distinct function to perform, which entails no mean responsibility. The understanding by the men that simply because labor has certain power they can abuse it will sooner or later become detrimental.

Political parties which further sound principles and administer fairly to rich and poor should be supported, and representatives to Congress should be selected not because of promises made to the masses, but because of their fairness and justice to all mankind. It would seem that the mining companies' officials can be most useful in this direction, and with the large number of foreigners engaged in the industry, it would appear that some interest should be taken to have all men who benefit by living in this country assume the responsibility of citizenship. This field is one where leaders in industrial work can do useful service in the guidance of the men for the establishment of the best citizenship in the world.

Ideas and Suggestions

Curbing King Alcohol

Last year one of the leading steel companies of this country posted notices in its plants to the effect that any employee who was found under the influence of liquor while at work, or who carried liquor on his person, would be discharged immediately; and, further, that when promotions were to be made they would go only to those who did not use intoxicants.

Those who at first made light of this policy in regard to liquor have now come to consider it with gravity, since promotions have already been made from the ranks of those who did not use intoxicants. This is but an introductory step in the promotion of this aspect of the safety-first propaganda.

Similar efforts are being made by many other coal-mining organizations to encourage sobriety among their employees. The coal operators know from costly experience that it is essential to reliability. The habitual drinker has no standing and is never selected to perform an exacting task. In short, he is not capable of shouldering responsibility.

In our national affairs nineteen states have decided in favor of prohibition. The people of these states have, of their own free will, voted for the control and removal of King Alcohol. Perhaps the industrial community, which, under the guidance of private management, is usually first to inaugurate reforms, will accept the initiative of the body politic.

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The Camera in Preliminary Coal Examinations

BY WILLIAM D. SELL*

In the preliminary examination of coal properties the camera ought to be considered as necessary a working tool to have in the haversack as the aneroid barometer. No statement or report can better be substantiated than by an appeal to the eye, and lacking the physical opportunity to furnish this, nothing is quite so convincing as a picture.

In the examination of a new coal territory, for instance, what is it the prospective investor first wants to know? The character and thickness of the coal, of course. The character may be described verbally, and figures may be given as to its thickness, but a small print of the opening itself will add immeasurably to the report.

A piece of flexible oilcloth, three inches wide and six to eight feet long, with the feet painted alternately black and white, should be carried. A strip of ordinary white table oilcloth properly prepared would serve the purpose. This strip should be fastened to a stick and placed by the opening to show in the view. It is also well to have a pad of paper and a piece of black crayon. The number of the shot should be marked on the pad and placed

where it will show, as this allows the number to be entered with the other data in the notebook and dispenses with all autographic records, for which there is no room on the film. Space should be left in the notebook for a copy of the print.

Our prospective investor is next likely to inquire as to the cover over the coal and how it is situated with regard to development. The barometer readings, of course, will disclose this, but a photograph of the towering mountain or hillside above the seam will give a new meaning through visualization. When the outcrop line is higher on the hill, it is frequently impossible to show this photographically. One must be content to give a general view of the hillside, and mark the line with white ink on the print, which will give the height above water level and serve to indicate the manner of its operation.

Your inquirer generally wishes to know, too, the character of the topography and the width of the valleys, and if there is land suitable for a townsite. Views of nearby operations are interesting, if they show the types that have been adopted for tipples, inclines, etc. Nor is it a poor idea to secure views of mining villages and plants, even though they be somewhat remote, provided similar physical topography can be shown. They will aid the imagination of the owner or promoter to visualize what the eventual "effect" will be when the tract is developed. Other matter thus to be shown will occur to any engineer reporting on lands of this character when once he becomes impressed with the advantage of the camera for this work.

It can easily be seen that if a "going" plant is to be reported on, a different kind of photographic representation must be made. The views are more important for this type of report than for the undeveloped tract, and in photographing the coal under cover, one must master the method of flashlight work—if he is permitted to do this.

The size of the pictures must be determined for each case. If the camera is to be a constant companion, then the smaller one should be chosen, although the tiny vest-pocket edition is not so preferable as a $2\frac{1}{4} \times 3\frac{1}{4}$. The lens aperture should be at least F.8, rectilinear, which for general work is to be preferred. With an achromatic of larger opening all sorts of difficulties arise in regard to exact focus, separation of planes and depth of focus. The camera should use roll film. An automatic shutter release should be in the kit, so that the photographer himself can get in the view whenever he deems it advisable. Even the most compact folding tripod is useless, though a small ball-and-socket clamp should be carried.

Unless developing and printing is done personally, it will be necessary to have amicable relations with a capable amateur, as the work of the ordinary drug store or camera supply shop is discouraging. If it must be done by commercial finishers, it is sometimes wise to obtain their prices for this kind of work, and then select the

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one whose figures are the highest. In photography in particular "price makes quality." When one is told that certain—and usually the most valuable—films were "no good," the contrary cannot be proved, nor can it be shown that a competent operator might have saved them by modified development.

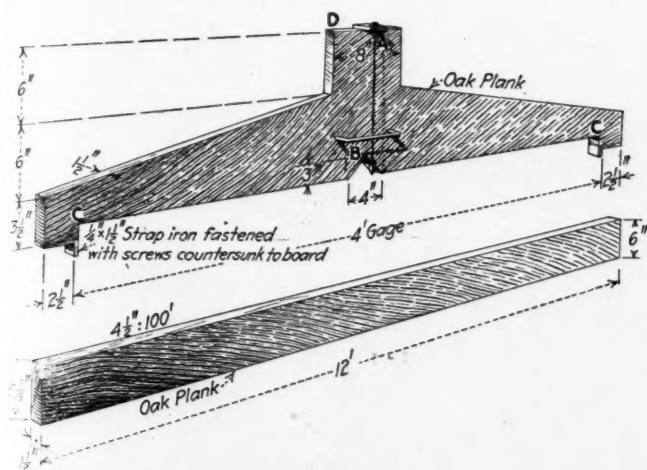
It used to be said that a photograph could not lie. Today even the veriest tyro takes pride in exhibiting a few "faked" pictures. For this reason care must be taken to forestall suspicion of your pictures. The use of the black and white ribbon rod makes it impossible to question the story it tells, provided it is put close against the face of the coal. If a view must be taken with the camera inclined from the horizontal, make a note of the approximate angle, also marking it plainly on the print when finished. Then in looking at it one can hold it either above or below the eye level the proper distance and get a correct impression.

Are photographs an aid? Try them and see—just once, as a matter of experiment. The enthusiasm with which an illustrated report is received might be considered unworthy, but if the persons for whom it is made can understand the report more readily by illustration—why not give it to them that way?

Gage and Level Boards for Track Laying

There are various devices used by the miner in laying track in the gangway or heading which he is driving, and those shown in the sketches seem to be as good as any.

The gage board shown in Fig. 1 is used in laying



FIGS. 1 AND 2. SIMPLE AND PRACTICAL DEVICES FOR LAYING TRACK IN COAL MINES

track; and before the second rail is spiked to the ties the miner should try his board on both rails to make sure that the gage just fits over the rails at the offsets CC. These offsets are reinforced with strap iron so that constant wear at these points will not alter the gage.

From A to B a straight line is marked in the exact center of the board and at right angles to the line CC. A cord with a plumb-bob attached is suspended at A so that the plumb will swing freely in the notch cut at B. In turning curves in the mine roads it is desirable to elevate the outside rail, and if the gage board is placed on the rails and a combination spirit level on which can be read the elevation per foot is placed on the plane

surface at D, the miner can readily raise his rail to the desired height.

These combination rules and spirit levels are universally used for all kinds of work in and around the mines and can be obtained at almost any hardware store for \$2.

The level board used by the miner for carrying his grade is shown in Fig. 2. The large end of the board is placed on the track with the small end pointing in the direction of the grade. The road is then raised or lowered until the bubble in the spirit level, on top of the board, comes to rest in the center of the rule.

It is extremely important that the miner should carry a good road, for many transportation delays, such as a wet road caused by poor drainage, and much expense and labor are avoided by it. If the miner uses these devices intelligently and his work is checked up occasionally by the mine foreman or his assistant there is no reason why he cannot lay track as well as the company tracklayer.

Sharpening Drills for Bad Ground

Sometimes when a miner encounters seamy or broken ground, especially when it is composed of hard, shattered rock, the ordinary drill, sharpened as shown in Fig. 2, does not give good results, for the edge is frequently

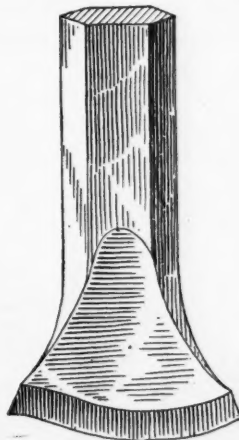


FIG. 1. SHOWING DRILL AS IT SHOULD BE SHARPENED

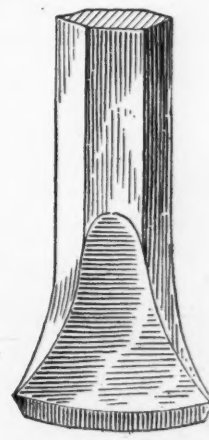


FIG. 2. THE OLD WAY OF SHAPING A DRILL

driven into a crack so that it is practically impossible to loosen or remove the drill.

This difficulty may be overcome by sharpening the drill as shown in Fig. 1, where it will be seen that the corners have been turned back so that the cutting edge assumes a curved outline. Such a drill point as this will ride over ordinary cracks and thus prevent sticking.

Next Week

The Aug. 12 issue of *Coal Age* will contain Mr. Watt's second article on "Mining Methods." Don't miss studying the mining and robbing plans he describes.

Coal-Mining Methods in Utah--I

By A. C. WATTS*

SYNOPSIS—The geology of the Utah coal measures is somewhat peculiar. Hard roof and floor are the usual conditions. Cover is thick, while faults, wants, igneous dikes, and burned-out areas with their residual heat, all influence the mining methods practiced.

A description of the coal-mining methods in Utah would not be complete without some remarks on the geology of the coal measures and a general description of the physical characteristics that govern, in a large measure, the mining methods that can be employed.

It is estimated that there are between 13,130 and 15,200 sq.mi. of coal-bearing measures in the state containing workable coal seams and an additional 2,000 sq.mi. that may contain such beds, but which have not been definitely proven. The total content of this area is estimated to be 196,458,000,000 short tons, of which approximately 32,000,000 tons has been extracted. The accompanying map, Fig. 3, shows in a general way, the principal coal fields.

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By far the most important field of these tremendous deposits lies in Carbon County, and in it the greatest development has been accomplished. Ninety per cent. of the state's production is being mined in this county. Geologically the coal measures are classified as belonging to the Mesa Verde formation of the Cretaceous period.

Present developments indicate the presence of three separate coal measures or horizons, known locally as the upper, main and subcoal. Overlying the upper measure is a massive gray sandstone from 200 to 700 ft. thick, named the Castle Gate Reef. This forms the high precipitous cliffs seen in the field. The upper coal measure lies just under the Castle Gate Reef and is from 200 to 500 ft. thick and consists of thin beds of sandstones and shales with thin seams of coal which are in some places 5 ft. thick. At present these seams have no commercial value.

The main coal horizon is from 200 to 500 ft. thick and consists of alternating beds of sandstones and shales with from two to four workable coal seams varying from 5 to 28 ft. in thickness. The main workable bed, known as the Castle Gate seam, varies from 5 to 20 ft. in thickness and rests on a massive, close grained, grayish-white



FIG. 1. GENERAL VIEW OF THE UTAH FUEL CO.'S OPERATIONS AT CASTLE GATE, UTAH

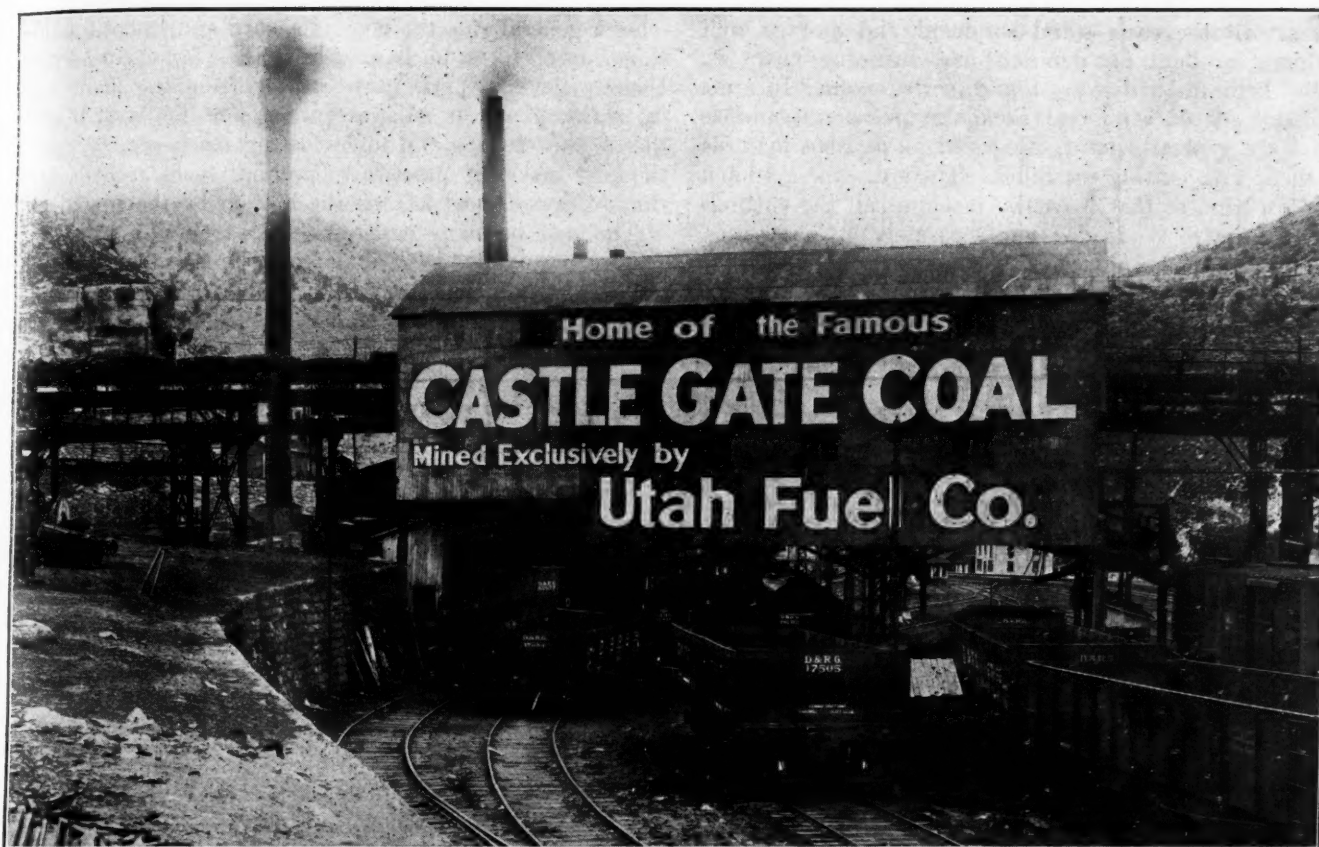


FIG. 2. THE TIPPLE AT CASTLE GATE, ARRANGED TO HANDLE OUTPUT OF TWO MINES. THE COMPANY SEEMINGLY BELIEVES IN ADVERTISING

sandstone locally known as the Castle Gate coal floor. The subcoal horizon is from 100 to 160 ft. thick and lies directly under the Castle Gate floor. The coal beds in this horizon are usually too thin to be workable, though one of the seams in at least one locality is of sufficient thickness and is being worked. It rests on a sandstone floor from 40 to 60 ft. thick lying on the Montana shales.

The problem of mining these coal deposits involves a study of mining thick, comparatively level or slightly inclined beds, for although some seams averaging from $4\frac{1}{2}$ to 8 ft. have been worked, no mines are now operating in anything less than 6-ft. coal and most of the mining is done in seams that vary from 8 to 28 ft. in thickness.

Considering solely the physical conditions affecting the extraction of coal and neglecting the financial and economic conditions which in this country often have greater influence in the laying out and working of a coal mine than the physical features of the field, the method of mining used must take into consideration the following: Number of workable seams; thickness of seams and their relation to one another; character of coal; pitch of seams; character of roof and floor; cover. And in addition, faults, dikes, wants, flow of water, and sometimes gas, and burned-out coal beds in place with their residual heat must be seriously considered, as they have important influences on the mining operations, both before laying out the mine and after they have been encountered.

Taking up these features in the order named, it is seen that throughout most of the field there are at least two workable seams and these are generally found in one coal horizon. In several sections, however, there are

three and sometimes four workable measures, and by workable is meant from 5 ft. in thickness up.

The distance between these seams varies considerably, so that in some sections there is no unusual problem involved in working them, but in other places two or more workable seams are found with so little intervening strata that their successful extraction involves problems yet to be solved. Thus we may have an 8- to 14-ft. seam underlying a 6- to 10-ft. seam with about 200 ft. of intervening strata; or a 5- to 8-ft. bed 60 ft. below one 5 to 11 ft. thick, which lies from 12 to 20 ft. below a 22-ft. seam, which in turn lies 30 ft. below a seam averaging about 6 ft. In other cases an 11-ft. bed is found from 3 to 40 ft. below one 6 ft. in thickness.

THE CHARACTER OF THE COAL

All these seams are a good grade of bituminous coal whose analysis will average about as follows:

Moisture	1.59
Volatile combustible matter.....	40.23
Fixed carbon	52.73
Ash	5.45
	100.00
Sulphur in ash.....	0.34
B.t.u.	13,412

The physical characteristics of the coal beds vary considerably throughout the district. Some have a bright, shiny luster with pronounced face cleavages, brittle and hard and breaking in generally slabby shapes. In other sections the coal has good cleavages but is much more massive and tough, though no harder, while in still other sections it is tough with no pronounced cleavages and breaks in large pieces. Almost without exception the coals are hard to cut, and some are hard to shoot. In

general all the coals stand shipment and storage well and are excellent for domestic and steaming purposes.

But little impurities are found in the seams. In some places bands of bony coal are quite persistent, and as these are generally hard, it is seldom possible to mine in them with cutting machines. Their thickness seldom exceeds 2 in., so that if cut by machine, all the cuttings would have to be loaded out separately as impurities. This of course could be done if the bands could be

As a general rule the floor is a hard and smooth sandstone, no clay bottom having been thus far encountered. Usually the coal parts quite readily from the floor, but in a few places it adheres rather tenaciously. Where this is encountered and undercutting machines are used, the cost makes it practically prohibitive to recover any thin section of coal left on the bottom by the machines.

The roof in many cases is shale varying in thickness from a few inches to several feet. Unless thick enough

to arch, this shale gives considerable trouble and is often dangerous. Where sandstone roof is found, it is generally good—too good in fact, for the sandstone is fine-grained, tough and massive and stays up too well. Much of the mining in Carbon County, Utah, is done under heavy cover. In some places at present the cover is over 2,000 ft. thick, and in but few localities is it less than 1,000 ft. The heavy cover makes the mining of these flat, thick seams a serious problem in itself, but the additional features of great irregularity in depth and the unyielding qualities of the thick beds of sandstone forming the overlying strata make the problem still more serious. A typical section is shown in Fig. 5 which illustrates how the overlying strata are cut up into precipitous mountains and deep cañons. Added to this is the feature that all these mines are opened from the outcrop and the workings are in loose-ended blocks of coal. In some sections faulting has taken place to a great extent and some of the displacements are found to be as great as 1,500 ft. The main faulting planes run almost due north and south. As a general rule the main displacements are strike faults; that is, their direction parallels the strike of the measures. Cross-faulting is not so severe, although in some districts it is quite troublesome. The coal is sometimes affected very detrimentally by this cross-faulting, but not as a rule by the main north and south faults.

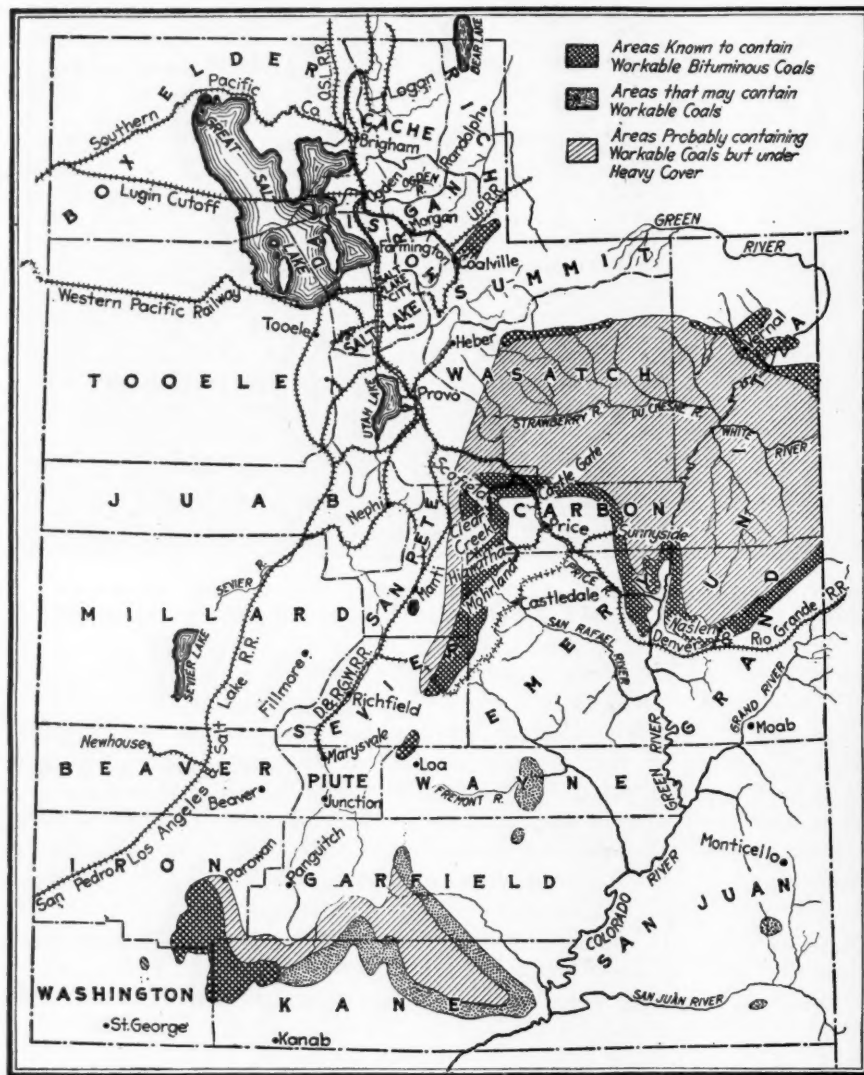


FIG. 3. COAL FIELDS OF UTAH

successfully cut, and the cuttings could be used under the boilers, but as previously stated the hardness of the impurities generally prohibits this practice.

THE PITCH OF THE SEAMS

The average maximum pitch of these coal beds does not exceed 10 per cent. In some places the beds lie practically flat. The Castle Gate seam, or lower seam of the main coal horizon, is found to have a much more even bedding than the others, whereas the upper seams are more or less rolling. In some mines the warping of the strata or the irregularity of the bedding is such that the direction of the pitch is changed materially, and this feature makes it more difficult to lay out the workings in a systematic and uniform manner and conforming to property lines. It gives irregular-shaped pillars and panels which are sometimes difficult to extract.

In one instance it was noted that the coal was almost invariably bright, hard and entirely normal right up to the main north and south faults, having throws varying from 30 to 200 ft., whereas adjacent to the cross-faults, which ranged between 4 and 15 ft., it was generally soft and discolored for as much as 100 ft. away from them and was unfit for commercial shipment. In this instance the condition was probably due to a twisting action which took place at the time of main faulting. Of course the drag of the main faults produced low places in which water from the faulting planes accumulates when coal is extracted and thus adds considerably to the trouble and expense of mining.

In some places the cracks in the coal seams formed by the action of the faults have been filled with what are locally termed "rock spar." These are exceedingly hard sandstone deposits, often with a large percentage

of sulphur, which extend down from the roof or up from the floor. Even next to a down fault on the upper side the cracks are found extending up from the floor. Generally these cracks roughly parallel the direction of the fault planes, but sometimes are observed running at angles from them, indicating a twisting action. These intrusions are sometimes unfortunately encountered in an entry and running parallel to its direction. As all work in this district is run strictly on sights, they become a great annoyance, as it is impossible to cut them with the ordinary mining machine.

DIKES CAUSE LITTLE TROUBLE

Igneous intrusions are not of such common occurrence as to cause much trouble. No laccolytic flows have been thus far encountered, all being in the form of dikes. As a general rule the coal is not affected to any great distance on the sides of the dikes, although some of the intrusions with their various splits will aggregate 40 ft. in thickness. In one mine a dike about 11½ ft. in thick-

subjected to some current and eroded, being later replaced by sediments. Because of the formation of the country and the changes of the ages, it is never possible to determine where these wants will occur or what their extent will be, and the coal bed is likely to be of very irregular shape.

BURNED-OUT COAL BEDS IN PLACE

When considering the natural phenomena encountered in the coal deposits and which have more or less influence upon the methods of mining that must be adopted, the large areas of burned-out coal beds cannot be ignored, although their importance may be more economical than technical. However, they present some features that modify, locally at least, the laying out and working of a mine. The distances in from the outcrop to which the coal has been burned in some instances are really remarkable, areas having burned in 2,500 ft.

The burning, so far as observation goes, has not extended below the main drainage level of the country,

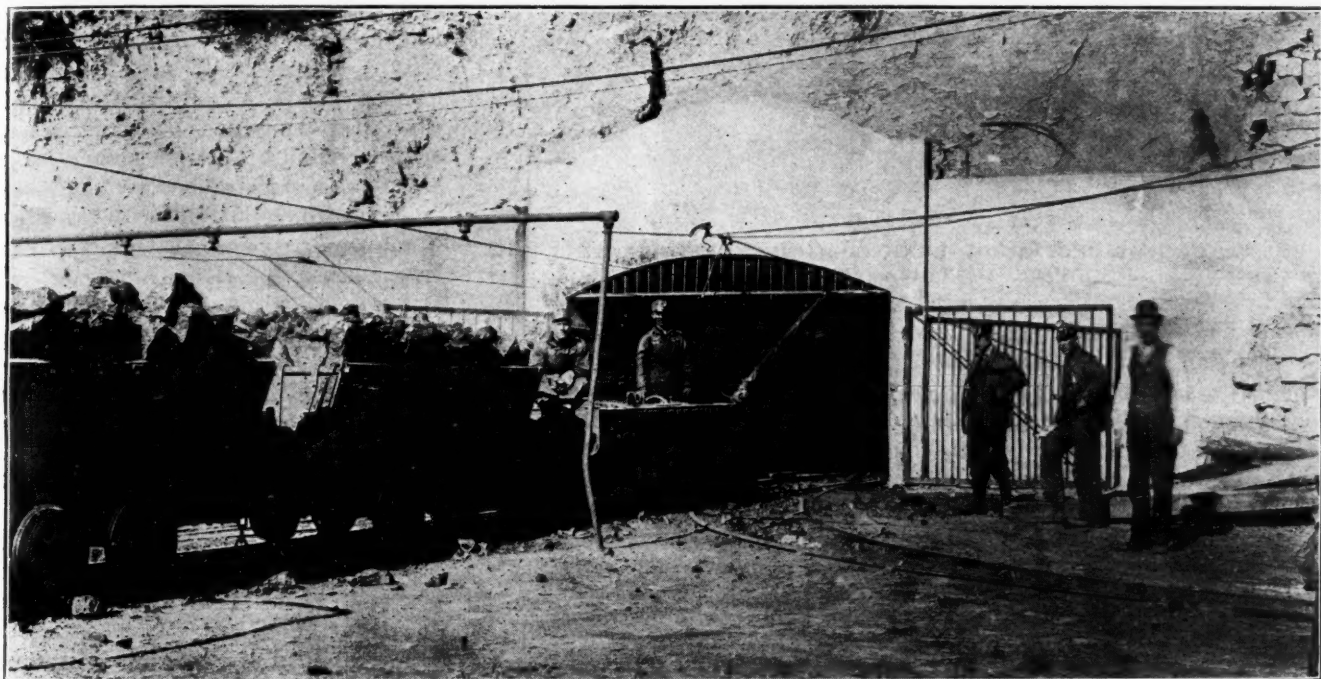


FIG. 4. NO. 1 MINE PORTAL, UTAH FUEL CO., CLEAR CREEK, UTAH

ness was struck. Upon driving through, it was found to have spread out over the top of the seam for a distance of about 15 ft. on each side, coking the coal into a very striking radiating columnar structure.

In another mine the whole thickness of the intrusion measured about 40 ft., but was divided into a number of thin flows between which the coked coal was found in its regular position with relation to the seam. Coking effects appear to be greater adjacent to the small dikes than to the larger ones.

A natural phenomenon that has proved troublesome in some parts is what are called "wants." These are areas in the measures barren of coal. The coal, without any change in structure or appearance, suddenly terminates against a solid face of shale or sandstone. An explanation of these occurrences is that the "wants" were the mouths of lagoons or old watercourses in which the coal, in a partly metamorphosed and soft condition, had become

although it has occurred under minor cañons or drainage feeders. Where more than one seam exists, it will sometimes be found that one bed has been burned out for a considerable area over a lower seam that remains unaffected, and conversely, the lower seam has sometimes been found to be burned for quite a distance under the upper seam, which remains intact although to some extent its bedding has been disturbed by settlement. The burning will generally be found greatest at the top of the seam, where the fire has been finally extinguished. Thus in the very thick seams an entry or room may be driven for quite a distance in the bottom of the bed in good coal before the roof becomes too bad to work under.

Mining close to burned areas is often dangerous if the burning has been above, because of the disintegration of the roof. The approach to burned areas is indicated by the presence of hydric sulphide gas, discoloration by white streaks and the rusty appearance of the coal.

Often water is struck. In one instance the water flow temporarily proved to be quite serious. In this mine a large flow of water was suddenly liberated in an entry that was being driven in good coal, causing the lower three levels of the mine to be drowned before a pump could be installed. This flow of water was not, however, an unmitigated evil, for the mine was an exceedingly

wall was once tried, but the roof was of such unyielding nature that it was abandoned.

The two-entry system is almost universally employed in opening the mines. To a certain extent this has lately been changed into what is practically a four-entry system, and in one instance three entries are used. Take, for example, a mine opened by a slope from which level entries are turned on each side. The first rooms off these entries are driven parallel to the slope and in some cases brought into connection at the top of the slope with the main aircourse so as to form part of the return-air system. In other cases these parallel rooms are kept as a part of the intake air system or are sometimes kept neutral. Crosscuts are driven between level entries on lines to connect the parallel room of the next lower levels, being connected with the corresponding room above, thus practically forming a continuous entry. When used for return air, overcasts are built over haulage roads of level entries, but when used simply as traveling ways, doors are hung. In this manner men are afforded safe and convenient passageways which do away with traveling in return airways or haulageways. The system also provides a means of transporting mining machines, gathering

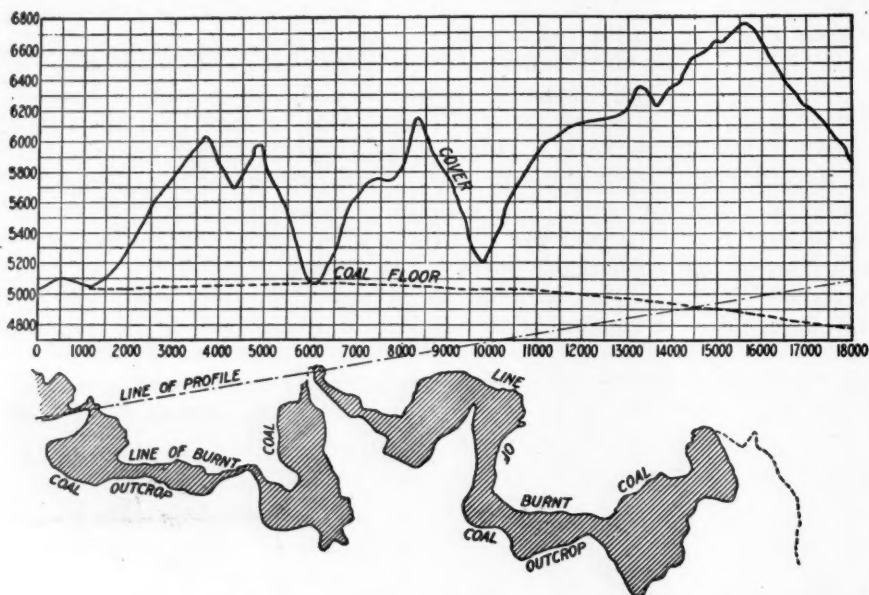


FIG. 5. TYPICAL SECTION OF UTAH COAL MEASURES, SHOWING HOW IRREGULAR IS THE OVERLYING STRATA

dry one and the water that was used for laying the dust by sprinkling had previously been pumped about four miles, with a lift of 1,600 ft. The striking of this water solved the sprinkling question for a time.

The water undoubtedly came from an underground reservoir formed by a burned-out coal bed and entered the mine through a crevasse caused by the settling of the burned-out area. The flow amounted at first to 2,250 gal. per min. and has continued for 18 mo. up to the present, when the flow is about 75 gal. per min.

In some localities the residual heat from some of these burned-out areas is still sufficient to cause trouble, and often alarm to the uninitiated. Temperatures as high as 150 deg. have been observed. In order to work in these places, it is necessary to employ large volumes of fresh air to reduce the temperature to between 80 and 90 deg.

With one exception all the coal mines of the district have been opened from the outcrop. This one exception is a property on which the coal does not crop. A steep incline was sunk so as to intersect the coal beds at the dip boundary of the property, thus placing all coal to the rise.

The place and manner of opening the mines are largely influenced by the topography of the country, often to such an extent that the main entrances are not in the best position with relation to the property lines.

Slopes or drifts are the means employed to enter the deposits. Where conditions of topography and property lines are harmonious, these main slopes are driven directly on the pitch of the seams, either up or down as the case may be.

Room-and-pillar mining is followed throughout; other methods have been tried, but with poor results. Long-

ing locomotives and supplies from one entry to another without using the main haulage slope.

Pillars between main entries are of course of various widths depending upon the conditions encountered. From a minimum width of 40 ft. they vary up to 100 ft. Those left on each side of main entries vary from 100 to 300 ft. in thickness.

A typical layout for a slope mine is shown in Fig. 6. The levels are turned to right and left off the slope at intervals of 450 ft. Between entries of a pair of levels is left from 40 to 60 ft. of pillar coal. In slope mines with pitches up to 10 per cent., the rooms are turned off the level entries at such direction as to cut the grade down to at least 6 per cent. and to bring the direction of the rooms at right angles to the face cleavages of the coal.

In most cases where slopes are driven directly on the pitch of the seam, it is found that the rooms, to be on the faces of the coal, must be turned approximately 45 deg. from the entry. In levels where the rooms will have to be turned back toward the slope, sharp curves in the tracks are avoided by turning rooms first at right angles to the levels and driving them from 25 to 50 ft. and then turning them on their true course. The length of the rooms will average about 350 ft.

A barrier pillar is left between the ends of the rooms and the level above of a width varying from 50 to 100 ft.; depending upon the system of working or whether the entries are in the same panel or not. When rooms have reached their limit, crosscuts are driven between their faces and parallel to the entry above so as to create a uniform barrier pillar. At intervals along the entry narrow rooms are driven through the barrier pillar to the aircourse of the levels above. These are to facilitate

traveling and to be used for air regulation in case of emergency.

Rooms are driven from 18 to 30 ft. wide. The latter width is seldom used as the cover is generally too great, but in some of the thinner seams under light cover this width is used to facilitate machine mining, for in room and pillar workings the time consumed in moving, loading and unloading of undercutting machines and sumping constitutes a large percentage of the total shift. Obviously any means by which it can be reduced without detriment to the mine is a saving.

Room pillars are made from 30 to 60 ft. wide where but one seam is worked. When two seams with but little intervening strata are worked at the same time, the sizes of the room and entry pillars are considerably increased.

In the older workings the level entries were sometimes driven to quite long distances. The first rooms would naturally be finished long before the entry was stopped, and it then became a question of either drawing pillars

line 45 deg. to the entry, and the upper levels of a rise or slope were extracted first. This method greatly decreased the danger from bounces and gave a better extraction together with a better grade of product, as the weight of cover had not affected the pillars so much in the shorter panels. This scheme also gave cheaper haulage.

(To be continued)

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Inspection of Anthracite Coal

By A. J. THOMPSON*

The system of inspection of anthracite at the mines varies somewhat in detail, but the result is practically the same. It begins with the empty railroad cars, which are swept thoroughly clean before the coal is loaded. It is nothing unusual for cars that contain tar, frozen sand, ashes or other material to be returned to the railroad without being completely unloaded.

At breakers where there are several pockets for the same size of coal and where there is a possibility that the material from all pockets is not of the same quality, it is customary to take the testing samples from the chutes as the coal flows into the car. Where there is only one pocket for each size and the coal is thoroughly mixed as it runs from the screens and other cleaning devices, thus insuring uniformity throughout, the samples are taken from the cars after they are loaded. This type of breaker, which is becoming quite general in modern practice, is by far the best, as it precludes "topping off," which means loading dirty coal in the bottom of cars and covering it with coal of better grade.

The samples, which are usually 50 lb., are taken from three representative places in the car; this gives an average of the whole car and shows whether it is all alike. The samples are taken by forcing the shovel below the surface and lifting it in such a way that none of the surface coal remains on it; thus should any slate have been picked off the top of the car after loading and before inspection, it would not affect the result obtained by the inspector.

After weighing the sample, the inspector carefully picks out all impurities, such as slate, bone, gravel, cinders and any other foreign matter. This he weighs on a scale graduated to half-ounces, which gives him the percentage of impurities in the coal. Should any of the tests show a higher percentage of impurities than allowed for that size, the car is condemned and is shifted back to the breaker, where it is dumped and the coal elevated and reprepared. If the coal has stood the slate test and been found good, it is then tested for size. The samples are hand-screened over a sieve with the same size holes as the screen on which the coal is prepared in the breaker. All falling through the sieve is weighed and if found to be above a certain percentage, the car is condemned and the coal must be reprepared.

At most mines it is a rule that after a condemned car has been emptied it must be reloaded with a different size of coal as a guarantee to the inspector that all of the condemned coal has been removed.

As coal inspectors are not a part of the regular colliery force nor are they subject to the colliery foreman's orders, they are free to do their duty without fear or favor.

*Chief Inspector, Kingston Coal Co., Kingston, Penn.

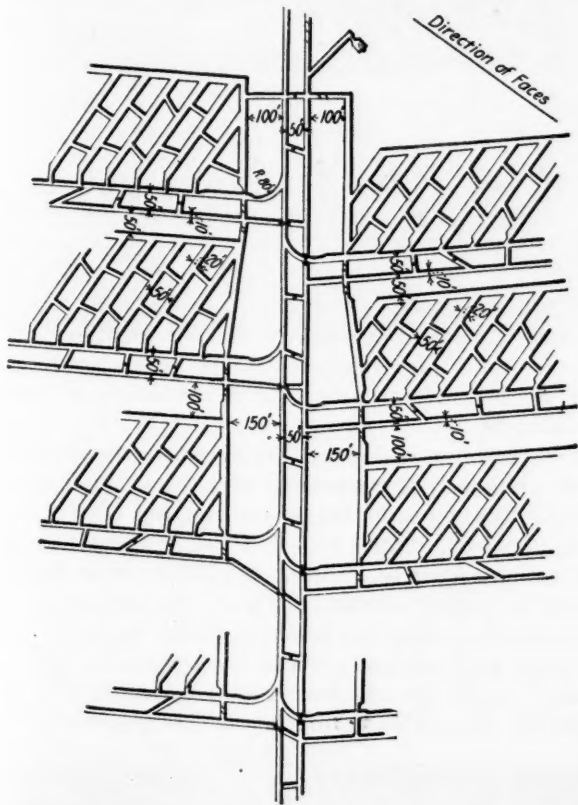


FIG. 6. GENERAL PLAN OF DEVELOPMENT FOR A SLOPE MINE

or letting them stand. In many cases the room pillars were brought back to within 150 ft. of the entry and then stopped. These room stumps were then pulled from the inside end of the entry, when chain and barrier pillars were also recovered. With several long entries in this shape, the roof pressure would of course be extreme on the pillars and "bounces" were liable to occur. Unlike some districts, bounces here are solely due to the pressure of an unyielding roof coming on a hard, brittle coal.

Later mining methods shortened the level entries to not over 1,500 ft. and made panels of two entries. The pillar separating panels was increased to 100 ft. in width, and no pillars were taken out until entries had reached their limits. Then the inside pillars were started on a

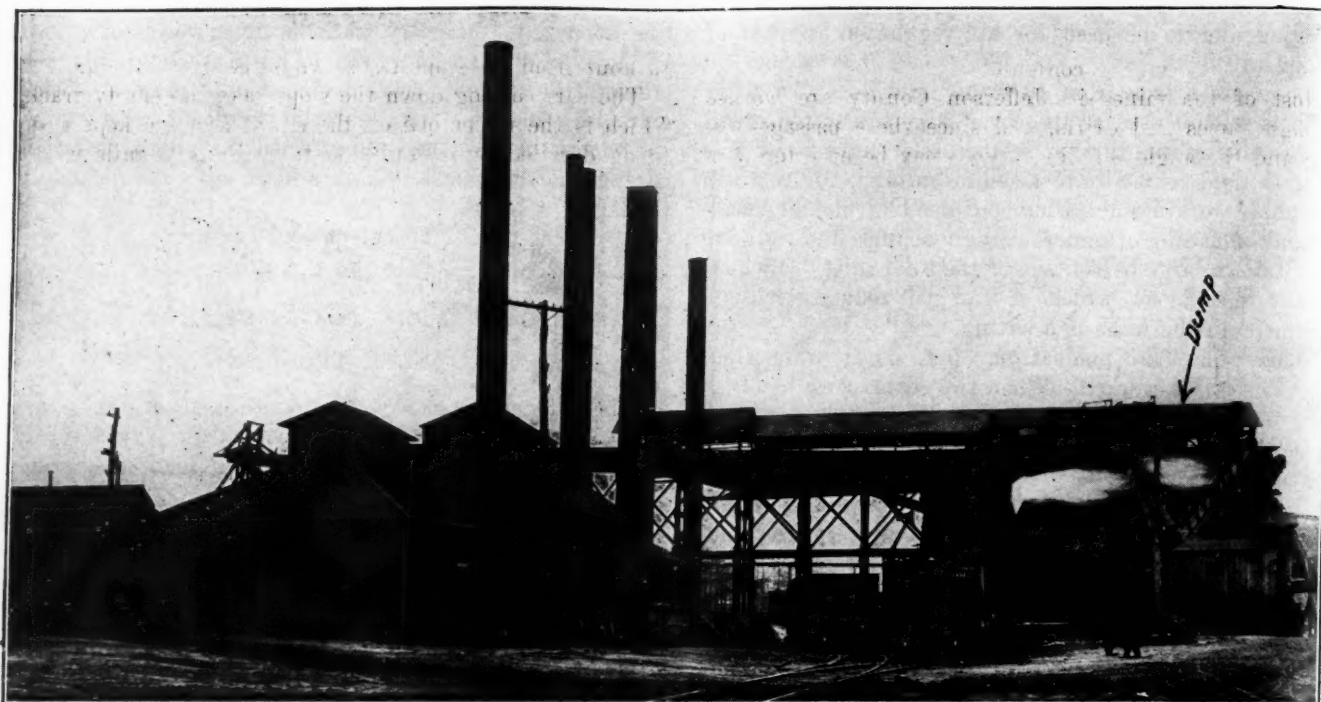


FIG. 1. HEADWORKS AT THE SAYRETON MINE, NEAR BIRMINGHAM, ALA.

Slope Haulage in Alabama

By E. B. WILSON*

SYNOPSIS—A short description of a slope of varying grade more than a mile long over which the record output of the state has been hauled.

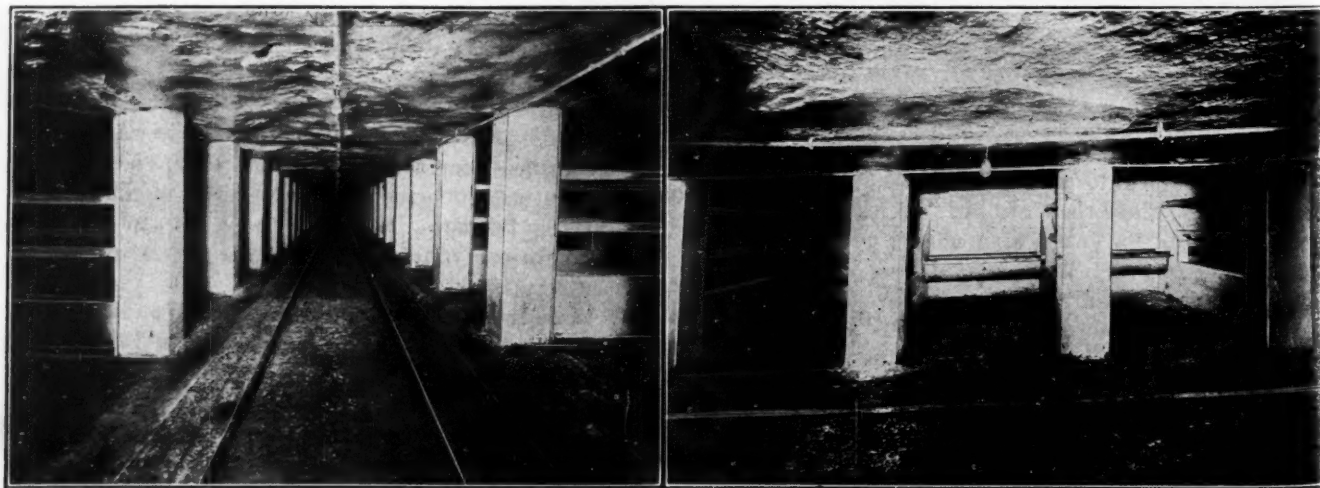
Alabama has approximately 180 coal mines scattered over 13 counties. The majority of these mines are in Jefferson and Walker Counties where the Pratt Consolidated Coal Co., the Republic Iron and Steel Co., the Sloss-Sheffield Steel and Iron Co., the Tennessee Coal, Iron and Railroad Co., and the Woodward Iron Co. have the greater number of their operations.

The conditions that involve coal mining in Alabama from an economic standpoint are about the same as else-

*Scranton, Penn.

where; that is, those coal mines connected with concerns that take their output steadily are not handicapped so badly as those mines that are compelled to work intermittently to conform with market conditions of supply and demand.

In Jefferson County the Pratt bed is the one most favored, although it varies from 36 to 52 in. in thickness, while the Mary Lee or Big Seam, ranging from 4 to 10 ft. comes next. The Nickel Plate, Blue Creek and Thompson, respectively 36, 82 and 70 in. thick, are also worked to a slight extent. Fifteen years ago the conditions of living, quarters and sanitation were no better than they were in some parts of West Virginia and Tennessee. At the present time those companies that have the means take pride in doing as much as possible to make



FIGS. 2 AND 3. TWO VIEWS OF AN UNDERGROUND STABLE

towns neat and living conditions sufficiently attractive that employees will be contented.

Most of the mines in Jefferson County are worked through slopes and drifts, and since these passages are long and the angles of dip vary it may be of interest to some to know how the cars are placed on the cross-entries.

Sayreton, one of the Republic Iron and Steel Co.'s mines, is in Jefferson County, 4 mi. north of Birmingham. The grade of the slope from the knuckle on the tippie for a distance of 980 ft. averages 26 per cent.; for the next 1,600 ft. it is 11 per cent.; from this point to the bottom of the basin—2,600 ft.—the dip is 6.2 per cent. The total length of the slope from the bottom to the top, including the tippie landing room, is 5,510 ft., the difference in elevation being 603 ft.

On the incline, cross-headings are turned every 300 to 400 ft. right and left beginning at 1,000 ft. down the

mi. per hour. Fig. 5 shows the long radius for a single turnout from the slope track, which is of 60-lb. rail.

The cars coming down the slope take the empty track, which is the upper one on the entry, and are kept from being derailed by a double system of guard rails which are placed inside of the loaded-track switch points and extend the full length of the side track. In this illustration only the turnout to the cross-entry is shown, and not the switch farther in that turns the cars to the entry and which also connects this track with the loaded one.

The curve for the loaded trip to the slope track is more abrupt than the curve on the empty track. In a double turnout the slope track is, say, to the right and the empty track to the left, with the loaded track in the center. A block is placed below the frog and serves as a kind of guard rail, but its chief office is to carry the rope over the rail to the loaded trip. It is termed a "sheave block," because the rope passes over it.

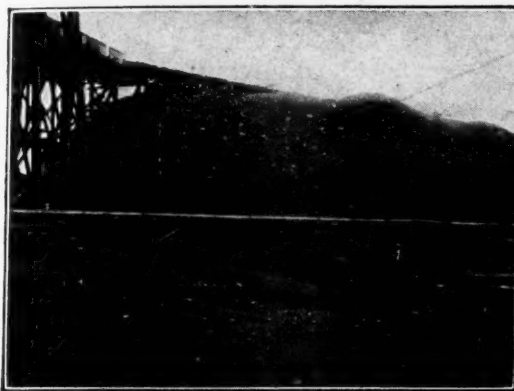


FIG. 4. TRIP EMERGING FROM SLOPE

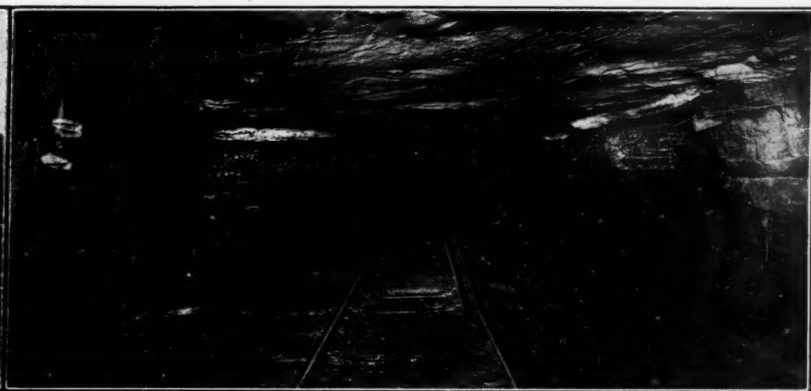


FIG. 5. SINGLE TURNOUT ON THE SLOPE

slope, a barrier pillar of 1,000 ft. having been left to protect the surface. The turnouts to cross-headings are single openings which are widened to double headings after the turn has been made, the upper track being for empty cars and the lower one for loads. Double turnouts are used from the slope only when cross-entries from necessity are turned abruptly from the slope.

The speed of hoisting varies, sometimes reaching 40 mi. per hr.; the speed when lowering the empty cars even surpasses this, but by the system of signalling adopted the trips are slowed down to about 12 mi. per hr. when they enter the cross-entries.

Fig. 4 in a general way gives the angle of the slope as it approaches the tippie. The cars weigh 2,500 lb., the load 3,800 lb., and as 11 cars are hoisted at one time the total load is 30.9 gross tons. The Mary Lee bed at this mine is 6½ ft. thick, and where at drift mines the cars might be reduced to 1,600 lb., at slope mines they are made heavier to withstand the stresses to which they are subjected.

Long split switches are used on the slope and for the turnouts, all of them being thrown by hand. This besides being considered safer conforms to the method of signalling.

Those who have tried to turn cars from slopes know that the speed of the cars must be checked or there will be a wreck, also that the turn from the slope to the entry must have a long radius and be a perfect curve. At the Sayreton mine the cars are slowed down as they near the entry, although they go to it at a speed of 12

The length of the Sayreton slope is a little over 1 mi., yet this mine has the record in Alabama for the number of tons hoisted in one day (1,803), and the total number of tons hoisted in one year (464,066). A working day is 10 hr. and the average number of tons of coal hoisted daily throughout the year was 1,557. The engine used is a 30x60-in. Vulcan of the first motion type, with a drum 9 ft. in diameter and 10 ft. long. The slope track is inspected every day, cleaned and sprinkled, and being the main artery of the mine it is kept in good repair, well ballasted and laid with heavy ties and the rails joined with long fish plates. This care of track and the system of signalling adopted are two of the reasons why so few wrecks occur at this mine.

Figs. 2 and 3 show the care used in constructing mule stables. Mules do the gathering in this mine and on account of the depth are kept below ground as a rule.

The writer is indebted to F. G. Morris for the information contained and the cuts accompanying this article.

Turkish Fuels Are of Interest Chiefly because of the importance of the railway industry in Asiatic Turkey. Geographical conditions make of the tracks in this region the most essential link in a chain of world-girdling lines. By its position Asia Minor can be likened to a bridge in the through routes destined to connect European factories with Asiatic and African markets. An uninterrupted right-of-way from points in central Europe to populous Indian cities must necessarily pass through the valleys of Anatolia. Crossing thence the Taurus Mountains its natural passage is indicated as the Mesopotamian lowland and the shores of the Indian Ocean. Similarly land connection between Europe and Africa can be obtained only by passage through Asia Minor, Syria and Palestine.—Leon Dominian in Transactions of the A. I. M. E.

Extracts from a Superintendent's Diary

"Once a miner always a miner" is pretty generally true; I see it demonstrated over and over again as the years roll by. Old timers at the business, becoming disgusted, wander away occasionally to try their hands at something else, but the passing of a few months finds them back in their old haunts, and it is pretty much the same with the younger men who have worked only a few years at the mining game. They may stay away longer and venture into many fields, but in the end they generally return declaring that they have been fools.

Today a man well along in the sixties came into camp in search of work, and upon being questioned by the time keeper as to his mining experience, replied that he moved away from this very camp about 20 years before and hadn't followed mining since, but he felt sure that some of our old citizens would remember him and if they did they would have to admit that he had been something of a miner in his day and would be good for a number of years' service still. And what was more to the point, he didn't propose to leave again, for he had certainly learned his lesson. Several of the older men hanging around the check window overheard the stranger's remarks, and it wasn't long before he was formally recognized and given a suitable welcome by some of his old-time "buddies."

Later in the day I heard something of his life's history from some of his "buddies." To them he was only another miner getting back into the mining game, but when I learned of the tragic manner in which he had first entered the occupation and in spite of which he had stuck to mining for years and was now returning to the work in his old age, I began to realize that the so-called "lure of mining" is not all myth.

This man, Robert McCrossin, while still under 21, was given a two years' sentence in a Georgia coal-mining camp, where all of the labor was performed by state convicts. (He had never been in a coal mine before.) Back in those days the prisoners were promptly leased out for the full term of their imprisonment to mining companies at so much per head, and then the state and all of its officials promptly lost all interest in the offenders except that the state's auditor checked the mining companies' books to see that all the money due from its convicts was regularly forthcoming.

Naturally the leasing companies, being left to their own devices, saw to it that bosses in their employ worked the convicts to the limit of their endurance. Occasionally they misjudged a man's capacity for labor and literally worked him to death.

Young McCrossin, having had no previous mining experience, was first put to work on a hand pump in the mine, and as he happened to have a splendid physique, he was made to understand that great things would be expected from him. He was no shirker, still, try as he might, he never seemed to be able to satisfy his boss. Finally his taskmaster hit upon a scheme that left nothing to be desired. He took McCrossin to a heading in the mine where two hand pumps were required to be operated continuously, and chaining him to one of the pumps, he informed him that he was strong enough to do with one pump the work that two pumpers had been doing and without further comment sent the two pumpers who

had been at work back to their bunks. As he was leaving, he remarked in an offhand way that failure to handle the water meant that the heading would be roofed in water and the pumper surely drowned.

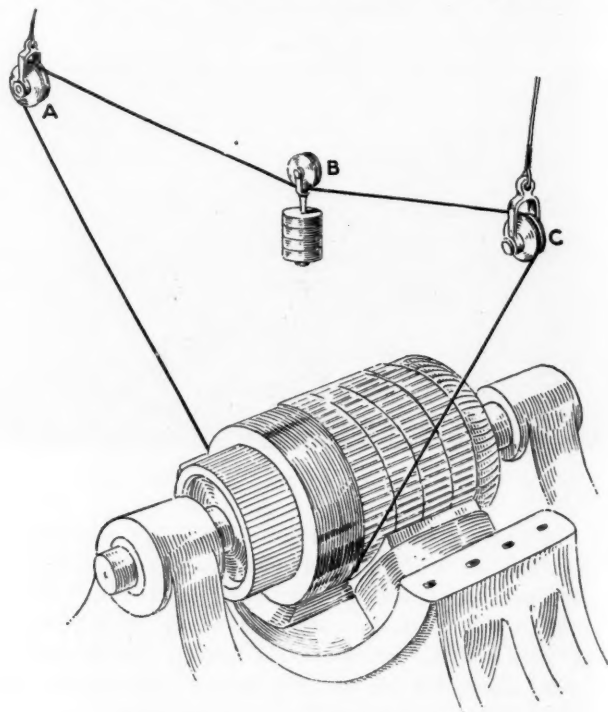
McCrossin lived through that ordeal, and when his sentence expired, he took up mining as his vocation.

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Replacing Band Wires

In rebanding armatures a method that I have used and found satisfactory for years upon all types of machines having a two-piece field yoke, says V. W. Miller in *Power*, is as follows:

Remove the top half of the field yoke and determine the number of wires to be used in the bands. Then secure the end of the wire to the armature and wind the



METHOD OF KEEPING WIRE TAUT

desired number of turns plus two upon a part of the armature rod to be rebanded. Having done this, pass the free end of the wire through the pulleys A, B and C as in the sketch, then back to the armature and secure this end after having drawn the wire taut, by hand. Give the armature one turn, then add enough weights on pulley B to pull the wire taut. It is obvious that the wire will now wind upon the armature as a band as rapidly as it is being unwound, and the result is accomplished without removing the armature from the machine.

When nearing the last turn of the band, it is advisable to remove part of the weight from B; otherwise one portion of the band will be taut while the other is loose. When the full number of turns is in the band, the band clip may be bent over on the wire and soldered. The weights are then removed from the pulley B and the ends of the wire are neatly trimmed at the band clip. Having done this, the band is ready to be soldered. The wire should be sand-papered before winding on the armature.

For a soldering fluid I have found the following to give the best results: Saturated solution of zinc chloride, five parts; alcohol, four parts; glycerin, one part.

Care of Mine Maps

BY GEORGE L. YASTE*

SYNOPSIS—Mine maps are frequently abused by self-important officials. This is demoralizing to the drafting force as well as detrimental to the maps. Tracings kept up to date do much to relieve wear on costly originals.

An engineer generally regards his maps as a thrifty house-wife does her articles of furniture. Anything that can be done to lengthen their life and keep them in good condition is to be commended.

It takes a man who has spent several weeks on the construction of a map to know how to handle it properly. He has the proper respect for the amount of labor entailed if not for the monetary value of the time consumed, while anyone who has been forced to do work on a dirty, broken map has it vividly impressed on his memory that a map cannot be handled too gently.

The life of the maps of any coal company is often reduced about one-half by the rough usage they are subjected to. This seems to be putting it rather strongly, but from an experience of a number of years I am inclined to believe that it is a conservative estimate. The rough usage comes, in the majority of cases, from the men from whom it would be least expected. This is from the officials, the chiefs of the various departments, the superintendents—men who in nine cases out of ten have advanced from subordinate positions and are perfectly familiar with the labor and expense entailed in the making of maps. They know in many instances from personal experience the difficulty and annoyance of trying to do accurate and neat work on a broken or dirty map. With their advancement they seem to have forgotten all this and seemingly have no regard for the handiwork of their successors. It seems as if this was the way the official shows his superiority, his authority to do as he pleases.

To cite a typical example: A superintendent comes into the engineering office. He wants to see a map of a particular locality and wants to see it quick. It is brought from the vault. He grabs it, slams it down on the table, grasps one end near the middle and flings the rest from him. As it unrolls he drops a weight on it. The weight may be a little dusty and his hands a trifle dirty, but that doesn't make any difference. He flings himself on the map, takes a blunt-pointed pencil of the nondescript variety and proceeds to make a few free-handed sketches with possibly an odd calculation or two on it also.

Now this man should be perfectly well aware of the damage he is doing. He evidently realizes the inconvenience to which he is putting those who have the mapping to do, yet he regards his time as being of so much value as to make it perfectly permissible for him to handle the maps as roughly as he pleases. A few moments of his time—barely a full minute would be required to handle it properly—is worth several years of the map's life. It costs several hours of someone's time to remove his sketches, calculations, etc., that could as

easily have been made on scratch paper and the removal of finger prints or the impression of dusty clothes which but a moment of his valuable time would also have rendered unnecessary.

His treatment of the map has a demoralizing influence on all who have witnessed his actions. Their respect for a map is lowered to his estimation for the same, while their treatment of the map will be disheartening to the man who has made or is making it.

He has seen it grow under his hands from a blank piece of paper to the valuable map it now is. He regards it as something of his own—a part of himself. He has taken the greatest of pains to make it accurate and neat and has endeavored to keep it clean. Then to see the ruthless manner in which it is maltreated and smudged, finger-printed and lead-penciled is discouraging, to say the least. He feels that he could hardly be less shocked if the same grimy hand had been placed on the bosom of his shirt.

But the worst is he can never regard the product of his skill with the same pride as he did before. On seeing how his superiors have treated it, he becomes less careful in his treatment of it. Not only does it suffer from this lack of care, but what is far more important, less attention is paid to the neatness and accuracy of any additional work placed upon it.

With the best of care maps will soon show the effects of the wear they are subjected to; their edges become frayed and cracked, the ink dim, the paper turns yellow or rather a dirty brown. The frayed edges can be obviated by binding the map. The best form of binding is a folded gummed binding of some tough cloth, which comes already prepared only requiring moistening to be put on the sheet. If put on neatly, it adds to the appearance of the map, fully protects the edges, and also at the same time protects the work itself, for it forms a slightly elevated track for the map to roll and unroll upon, causing less wear and rubbing of the inked surface.

The best possible way to lengthen the life of a map is by making a tracing of it which should be used as much as possible in place of the original. An accurate tracing kept fully up to date will answer the purpose of the original in nearly all instances. In case of consultation by the various officials it does just as well, if not better, on account of the less bulk to handle. Minor details and small surveys can be plotted directly upon it. Fifty per cent. of the wear and tear of a map will be taken off it by proper use of the tracing.

A map should, as far as possible, be in charge of but one man. If he puts on all the work and knows that he is responsible for it, greater care and neatness will be exercised. He will take greater pride in it, knowing it is all his own handiwork and not a patchwork of two or three indifferent draftsmen, and the condition of the map will reflect this pride. There is nothing so detrimental to the appearance of a map as to have three or four men do work on it promiscuously. Let one man plot the surveys. Have the tracing immediately brought up to date, and it will only be necessary for one man to handle the map.

*Lonaconing, Md.

Revolving Dumps at Coal Mines

By H. S. GEISMER

SYNOPSIS—*There is nothing new in the principle of the revolving dump. The size of these machines however varies greatly. It would appear that this method of unloading mine cars has much to recommend it and is steadily increasing in favor.*

Several years ago, Erskine Ramsay, of Birmingham, Ala., designed a revolving car dump and recently two installations have been made which show the wide variation of its adaptability.

A number of revolving dumps have been built and there is nothing novel in the idea of turning a car, or several cars, completely over in a cylinder. The special feature of the Ramsay dump is in the idea of having the dumping cylinder set at an inclination so that the cars, still attached to the haulage rope and coupled together, will start by gravity after being emptied by the rotation of the cylinder.

The H. C. Frick Coke Co. has completed, at the Lemont No. 2 coal mine in Pennsylvania, one of these dumps which has a capacity of eighteen 1½-ton mine cars, without uncoupling, and the Jagger Coal Co., at Jagger, Ala., has completed one to handle three 1-ton cars. Notwithstanding the difference in the capacities of these two machines, their construction and appearance is similar, as can be seen by the accompanying photographs. About the only difference is in the length and the corresponding variations in the weight of material used in their construction.

Both dumps are revolved by means of a wire rope which is given its movement by a piston in a steam cylinder. Steam or air can be used with equal efficiency, 90-lb. pressure being ordinarily employed. With the Jagger dump, a single wire rope is used. This may be clearly seen in Fig. 1. With the Frick dump, on account of its unusual length, it was necessary to use several ropes attached at different points along the cylinder. Equalization of the pull transmitted by these ropes necessitated the use of the sheaves that are so noticeable in Fig. 3.

In the Jagger dump the cylinder is 14 in. in diameter with a 4-ft. stroke, while in the Frick dump the cylinder is 18 in. in diameter and 6 ft. long. In both cases the rope is compounded; otherwise a much longer cylinder would have been required.

The rolled steel tires, which serve the double purpose of frame and rolling device, rest and revolve on trunnion wheels, fitted with short shafts. The angles running lengthwise through the dump are so placed that they hold the car wheels firmly in position while the cylinder is being rotated. Both dumps are built on a gradient of 12 per cent.

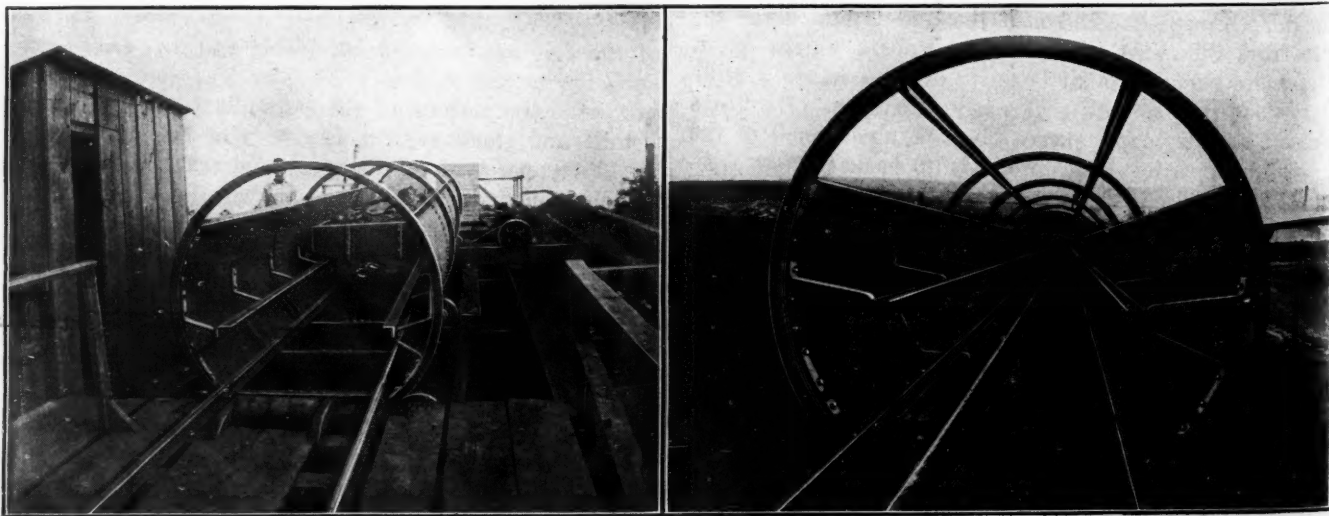
The average time consumed in dumping a trip is but a few seconds; the man who has charge of the dumping also removes the miners' checks from the cars, so only one man is required on the tippie.

It happens that at neither of the plants under discussion is weighing of the coal cars required on the tippie. With dumps of this type, where weighing is necessary just before dumping, the scale is placed at the mouth of the cylinder and the man who operates the dump also attends to the weighing of the coal.

There is quite as much variation in the product handled by these dumps as there is in their size. The dump built for the Frick company handles run-of-mine coal which needs no further preparation but is loaded directly from the bins into larries and transported to the coke ovens. The Jagger dump handles run-of-mine coal which is sold on the open market for steam and domestic purposes and the material has to be sized and cleaned before being loaded on railroad cars.

In designing the Frick dump, the possible breakage of the coal did not have to be taken into consideration, but with the Jagger machine it was necessary to keep in mind the necessity of delivering as large a percentage of lump as possible because the lump coal brings the highest price. The percentage of lump secured with the Jagger dump is large.

At the Jagger operation the coal is taken from the bin underneath the dump through a feeder and is de-



FIGS. 1 AND 2. END VIEWS OF THE JAGGER AND FRICK DUMPS

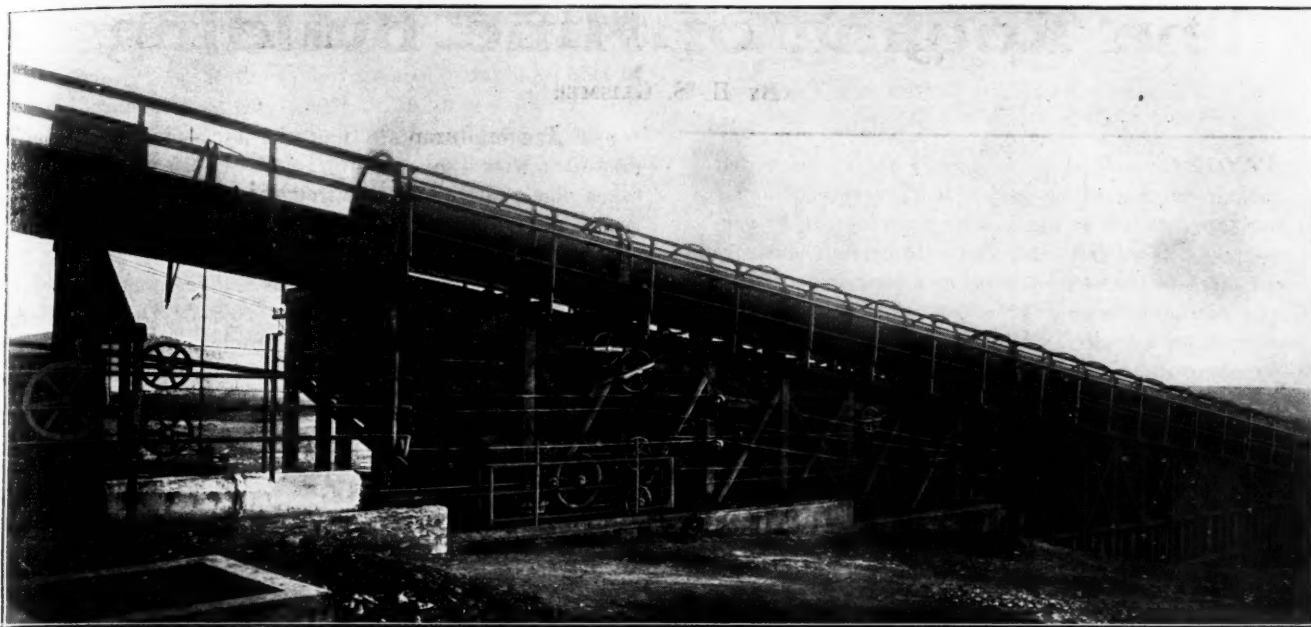


FIG. 3. SIDE VIEW OF THE FRICK DUMP, SHOWING ITS GREAT LENGTH

livered to a double shaking screen which separates it into three sizes—lump, nut and slack. The nut and lump are then fed onto picking belts and the slack is loaded directly into railroad cars or is dropped into a bin underneath the tippie as desired.

Aside from all questions of cost and capacity, revolving dumps are coming into favor at coal-mining plants, principally because they permit of the use of cars without end gates or drop bottoms. This is an important feature in coal-mine service, because it has never been found possible to make a tight car where an end gate or drop-bottom design was followed.

The scattering of fine coal along haulageways in the mines is a constant source of danger, and also adds greatly to the cost of maintenance of these roads.

Acknowledgment is made to J. P. K. Miller, chief engineer of the H. C. Frick Coke Co., and to E. P. Rosamond, general manager of the Jagger Coal Co., for their kindness in furnishing the data and photographs which form the basis of this article.

Questions That Often Puzzle Mine Foremen

BY A PENNSYLVANIA FOREMAN

In reading *Coal Age* I have found many interesting notes and suggestions relating to coal mining, but so far, no particular mention has been made of the growing scarcity of labor, which is a matter of much interest to mine foremen. Permit me to suggest the following:

For the last two years, or since the war began, the mines in this country have experienced a scarcity of labor that has been felt in some districts more than in others. Many of our good miners have gone to the seat of war, and I regret to say that others have taken advantage of this condition to urge claims that it can hardly be expected operators would accept were it not for the handicap of shortage of men. In some places strikes have been called and the mines thrown idle.

One of the questions that puzzle many mine superintendents and foremen at the present time is, How

can I get men? Frequently the men manifest a disposition to be over-particular. Perhaps some of the entries in a mine are bad; some rooms have water at the face; in places the road is too far back from the rib, requiring the coal to be handled a little distance. If you show a man a rib, he is sure to want an entry; if you show him an entry, he will want a room, perhaps a new one at that. Men who worked on the east side a few months ago now want to go to the west side of the mine and for no particular reason, as far as one can observe. These conditions are a source of continual worry to the patient mine foreman who strives honestly to please his men and maintain the output of the mine.

Let me suggest that a few letters in *Coal Age* giving the practical experience of mine superintendents and foremen on the foregoing questions and others, would be of great interest to a large number of readers. For example, I would suggest the following:

"How I got the east dips working." "How I satisfied my men working ribs." "My experience in making entrymen out of room workers." "Getting the coal out by the ton."

These and a thousand similar reminiscent experiences of foremen, assistant foremen and firebosses would unquestionably prove of great help and assistance to all who are trying hard and studying the question of getting the desired efficiency from their men.

The Deterioration in Anthracite Coal—Charles Dorrance, Jr., general superintendent of the Hudson Coal Co., said in an address before the Pennsylvania Coal Merchants Association: "We have a force of men, at least three at each colliery of any size, who do nothing else but try to see that coal goes to market in a uniform condition within the limits of standard preparation, as developed and made permanent by the Philadelphia & Reading Sales Contract of 1892, which is the basis for the standard preparation of coal. We cannot, however, give you gentlemen coal of the grade that was mined 30 years ago. We must confess that the quality, appearance, brightness and the fracture of all Pennsylvania anthracite coal are becoming poorer and poorer as time goes on; the cream of the anthracite is gone, and we have got to do the best we can with what is left. However, it is encouraging to note that during the last 10 years the complaints received by the anthracite companies involve less than one-half of 1 per cent. of all the coal that was shipped."

The Roofing of Mine Buildings*

BY J. W. LATIMER†

SYNOPSIS—If mine buildings are to be roofed with green sheathing only a temporary coating of tar paper should be used, as no covering can be permanent. Wool felt saturated with asphalt or stearine pitch in time will dry out and blow away. Nails and fasteners should be of an uncorrodible alloy covered with spelter. A permanent roof is obtained by using an asphalt-bound asbestos, covered by a coating of asbestos, whereby the asphalt may be protected from drying out in the heat of the sun.

Many of the operations in West Virginia and other states are located where primeval forests or perhaps second-growth timber stand, and one of the first things done before opening a mine is to ship a sawmill to the site and set it up to cut the available timber into lumber for building and other purposes. As a result unseasoned lumber is used in the houses and it soon shrinks. If galvanized steel is placed over sheathing, the tannic acid from the lumber soon corrodes the metal or the nails which secure it and the result is a leaky roof. This occurs whether the nails are of uncoated steel or are protected by dipping in spelter.

Perhaps the owner has been prudent enough to ship in a shingle machine and has cut his own shingles and applied them on the top of the unseasoned sheathing. But even in this case his precautions will be in vain for the nails will be eaten out by the tannic acid.

Again, the mine owner may not consider the use of iron or shingles but may purchase roofings manufactured from wool felt saturated with asphalt or stearine pitch. As a result of using unseasoned material the sheathing shrinks and causes the roofing to buckle and pull apart. Therefore, if it is necessary to use green sheathing, use a cheap, preferably a wool-felt material on account of the ease of application, and after the sheathing has been well seasoned, then apply a permanent roof. But if a good lumber market is close at hand do not apply any roofing on green or unseasoned boards but rather reject the lumber on the ground and purchase well-seasoned sheathing if the best results are to be obtained from the roofing used.

DESTRUCTION BY SULPHURIC ACIDS, WIND AND SUN

Moreover, around coal mines there is usually a large amount of sulphur in the atmosphere. This may be in the form of sulphureted hydrogen, or if the houses are close to streams which contain much sulphur, there may even be sulphuric acid in the air, and if this is so this acid will be carried to the tops of the sheets and to the nails that hold the sheathing boards. Corrosion will occur and in a short time you will have a leaky roof.

Wool felt saturated with asphalt or stearine pitch if placed on seasoned lumber and laid in sheets not over 10 ft. in length will last from 10 to 15 years, if properly coated with a good linseed-oil asphalt-base coating. But the fastenings must be first-class, made of an alloy of iron,

copper and other metals that will not easily corrode, covered over with a good spelter. In 10 to 15 years oxidation takes place with the result that the material is dried out; the asphalt or stearine pitch is blown away in the form of dust and the wool felt in fine wooly shreds.

Slate is only as permanent as the fasteners by which it is kept in place. When they corrode the slate falls. But in addition slate is likely to crumble. Some slate after eight or ten years disintegrates to such an extent that it looks more like a semiplastic clay than a quarry slate. Copper might give permanent service for the general manager's or superintendent's residence if it did not need fastening, and if it did not give so much trouble with its expansion and contraction. A good grade of tin plate might be considered a suitable covering, but it will corrode almost as rapidly as galvanized iron.

ASBESTOS PRODUCTS AS ROOFING MATERIALS

A few years ago an American traveling in Europe discovered a grayish-white roofing material on various buildings which on investigating he discovered were asbestos shingles. He found out the method of manufacture and commenced to make what is known as asbestos wood and the asbestos shingle. The material is composed of asbestos fiber and portland cement mixed dry. Water is added later and the mass is subjected to a pressure of 15 tons per square inch, the result being an unseasoned asbestos shingle having twice the density of ordinary concrete.

The material is then taken to the dry house where it is allowed to cure for about six weeks, after which it is ready for the market. The slates are suitable for buildings, the roofs of which have pitches of four or more inches to the foot. They are fastened by special galvanized or copper nails which will stand the action of the elements indefinitely. They are furnished in three colors, gray, red and brown.

POWER HOUSES NEED A REINFORCED ROOFING

The roofing for the steep surfaces of power houses and tipples does not have to be so elaborate or artistic, but above all it must be durable, for a drop of moisture on certain portions of the electrical equipment may put it out of commission.

Slate for this purpose has all the objections previously mentioned, but this is not all. The vibration if considerable will crack it and it will go to pieces. Reinforced asbestos roofing will best serve for such buildings. The roof, of course, will be held in place by fastening it to the trusses and purlins. The material must be strong enough to withstand the wind pressure, its own weight and that of a man who may be sent up to make necessary repairs to the monitor windows. It must also be corrosion proof.

This asbestos roofing is composed of a perforated metal sheet, the holes being on approximately 3-in. centers, the gage of the plate being determined by the service required of it. Over and under the plate is placed one or two plies of saturated asbestos felt which is held to the sheet by means of asphalt and additionally secured by the asphalt key through the holes.

Reinforced asphalt roofing is made with three, four and five plies of asbestos felt. The asbestos in the felt is

*Article read before the West Virginia Coal Mining Institute, at Bluefield, W. Va., June 1, 1916. It was noted on the program under the title "The Asbestos Shingle."

†Cleveland, Ohio.

impregnated with asphaltic compound, the asphalt passing between and around each fiber. The plies are also cemented together by the same asphaltic compound. It is this asphalt which is the life of the roofing material and it is protected from the elements by the asbestos, which it cements. It cannot be used in any place where ordinary galvanized metal roofing would be unsuitable.

For buildings with wood sheathing that have pitches of two or more inches to the foot, three- or four-ply Brooks brand roofing may be used, being held in place by either copper nails, large-headed double-galvanized thin-shank nails or galvanized roofing cleats. The nails are made specially for the work and are dipped in a heavy spelter. The cleats are made of alloyed iron sheets suitably stamped, coated and then dipped in the same way. Such roofing felts are weatherproof, waterproof, acidproof and timeproof.

A FLAT ROOF REQUIRES A BUILT-UP COVERING

Flat roofs for power houses and stores cannot be covered satisfactorily with the ordinary 2-in. lap or even with 6-in. lap prepared roofing, but should be protected by what is known as a built-up covering.

The wood sheathing should be well seasoned and matched. It should preferably be tongued and grooved and fairly sound; that is, the material can contain knots but they must not be loose. A two-ply asbestos roofing material composed of one-ply plain and the other saturated is laid first. These two plies are cemented together at the factory by means of a special asphaltic compound. This lower covering is thoroughly nailed in position and over the top of it, in hot asphalt, are placed two sheets of impregnated asbestos roofing felt applied so that approximately one-half of each sheet is exposed to the weather. This coating is nailed thoroughly at intervals to the sheathing boards at the top of each sheet. The surface is coated with asphalt paint so as to present a neat and even appearance. Such a roofing will stand the vibration to which power houses, tipples and other like buildings are always subjected.

Where roofing is applied over concrete, the top of the concrete is first coated with a concrete primer so as to give a good bond for the materials added later. The whole surface is then mopped with a hot asphaltic compound and in this, while hot, are embedded three plies of saturated asbestos roofing felt with approximately one-third of each sheet exposed to the weather. A coat of asphalt paint is then placed over this to give a neat appearance.

ASBESTOS SHEDS WATER LIKE A SPIDER'S WEB

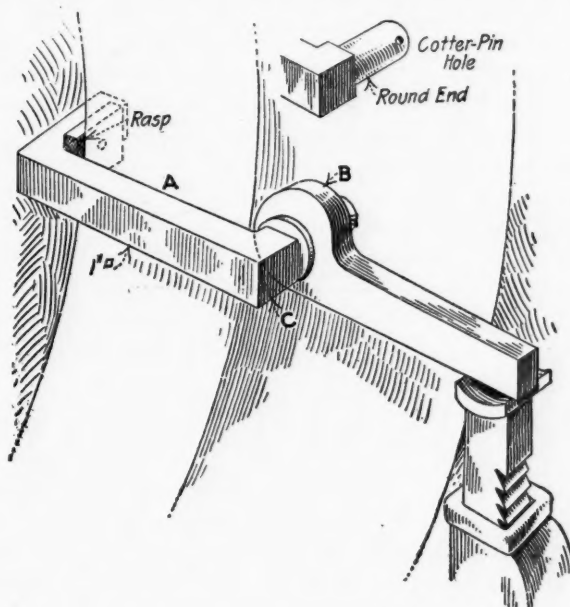
Asbestos is noncapillary and paint will not be absorbed by it; but any other roofing material should be covered with a good asphalt linseed-oil paint. The life of asbestos roofing is in the asphalt which is protected by the asbestos felt, which may be saturated or unsaturated. To all intents and purposes in the manufacture of asbestos roofing a cobweb of asbestos materials is placed over the asphalt to protect it. During a rain storm a spider web does not soak up moisture. The water runs off it much as it does off an oil-saturated board. Just in the same way water runs off the asbestos covering.

As the asbestos is stone it needs no coating. The life of the roofing—the asphaltic cement—is placed away from the play of the elements and thus the oil which in turn is the life of the asphalt is less slowly evaporated than it would be from an open wool-fiber sheet.

An Engine-Turning Jack

We have a 450-hp. engine, the flywheel of which has a 24-in. face and a rim 9 in. thick. The rig used for turning the engine off the center marred the face of the wheel where it bit, says John C. Morton in *Power*.

I devised a home-made arrangement that will not mark the wheel. It consists of a piece of 1-in. square steel, made like A, and a piece of flat iron $\frac{3}{4}$ in. thick made like



RIG FOR TURNING A FLYWHEEL

B. This piece is put on the rounded end C of the clamp, with a washer on each side and a cotter pin through the end of the round piece. On the square end of the arm A a 2-in. piece of an old rasp was riveted so as to bite the inside of the rim. A lifting jack is used on the outer end of the piece B. There is no slip to this rig, as the heavier the lift the tighter it takes hold.

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Gathering-Motor Haulage

BY OSTEL BULLOCK*

Recently someone suggested in *Coal Age* that the subject of gathering-motor haulage in mines should be discussed. I want to indorse that suggestion and to say that this is one of the problems all mining men must solve in the next few years.

In mines equipped with electricity, and where electric gathering motors have been installed, it has been found that their use in place of mules has greatly reduced the expense of operation, in moving the coal from the working face to the inside parting where the trips are made up. The motors consume no oxygen, leave no refuse behind them and in other ways prove more desirable than mules for this work. It would indeed be interesting if those who have employed gathering motors would give their experiences and describe in detail the system of hauling that they have established.

It frequently happens that any new system with which one is unfamiliar will often prove a failure because suitable provision is not made for its proper working. I recall such an instance that occurred some seven or eight years

*Clothier, W. Va.

ago in an attempt to adopt gathering motors at the working face in a mine. As is too often the case, the new system did not meet with hearty coöperation on the part of the mine foreman and his assistants, because they thought it was a scheme of the mine superintendent to reduce the working force by cutting out the drivers. There have been only two half-hearted efforts made to adopt gathering motors in this field.

The instance to which I have referred happened in Ohio County, Kentucky. The coal was from 4 ft. to 4 ft. 6 in. high and had a good top and bottom. The mine was worked on the room-and-pillar system, the rooms being turned off both entries and worked 100 yd. deep. The experiment of using gathering motors was tried on a single pair of cross-entries. An inside parting was made, having a switch at each end. The parting was 250 ft. long, and the inby switch was just outside of No. 10 room. The rooms working on this entry were Nos. 12 to 44. At every twelfth room a crossover switch was laid to reach the rooms on the blind entry.

The motor would take in from six to nine empties and haul out the same number of loads. One empty was left on each room switch when going in. The motor would then go through the crossover to the blind entry and gather a load from each room on that entry on its way out. A triprider would take the crab attached to the end of the cable, drag it into a room and hook it to a loaded car standing at the face. To drag this cable back to the end of a long room was no easy task and a triprider would seldom work more than a few days before he would quit, and a new man would have to be drilled in his place. When the cable was attached the motor would be started and the load drawn to the mouth of the room.

It so happened that, owing to the scarcity of rails in this mine, a switch would often be laid through the last

crosscut in a room, leading to an adjoining room, and the load from that room brought out through the crosscut, so that the rails in that room could be used in another place. This, however, caused the cable to pull across the two ribs of the crosscut, and frequently a wreck was the result. This and other less important reasons led to the gathering motor being condemned, although had proper provision been made for its use it would have been found that it could do the work of five mules; and two men would have been required in place of the five drivers.

Today it is hardly necessary to repeat that, in the adoption of any new scheme, it is needful to study the situation carefully and make the conditions conform to the working of the new system, in order to insure success. The failure to do this often affects not only one mine, but the entire field or district. Because of the failure in one mine, the new system is regarded with suspicion by others, and what might have proved a means of success is cast aside as of no value.

COMING MEETINGS

National Safety Council will hold its next meeting in Detroit, Mich., Oct. 17-20. Secretary, W. H. Cameron, Continental and Commercial Bank Building, Chicago, Ill.

The American Mining Congress will hold its 19th annual session during the week beginning Nov. 13, 1916, at Chicago, Ill. Secretary, James F. Callbreath, Munsey Building, Washington, D. C.

National Commissary Managers' Association will hold its 7th annual convention at the Hotel La Salle, Chicago, Ill., Aug. 8-10, 1916. Secretary-treasurer, Russell E. Lee, Manhattan Building, Chicago, Ill.

New York State Coal Merchants' Association will hold its annual convention Sept. 21-24 at the United States Hotel, Saratoga Springs, N. Y. During the convention addresses will be given on the most up-to-date time-saving methods for both office and yard. Secretary, L. V. Shepard, Elmira, N. Y.

Cut Out the Kinks!

By R. T. STROHM

Written Expressly for Coal Age

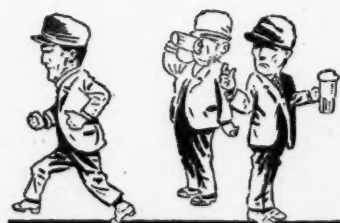


THE air that courses breezily
To ventilate the mines
Moves rapidly and easily
In straight and even lines;
But when its paths are sinuous
And speed of movement sinks
And troubles grow continuous,
Cut out the kinks!

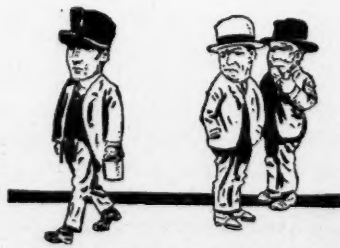
For making vision blearier
And tangling human feet
There's nothing yet superior
To liquor taken neat;
So, if you travel warily,
Refuse befuddling drinks
Politely but summarily—
Cut out the kinks!

Beware of grandiosity
In what you have to say;
Shun roundabout verbosity
And take the shortest way.
Tautology's endurable
In diplomatic kinks,
But other folks are curable—
Cut out the kinks!

The snake—who is circuitous
And twisting in his gait—
The crook and knave may smirk at us
Because our ways are straight;
But since we loathe obliquity
In greasers and in Chinks
And creatures of iniquity,
Cut out the kinks!



Politely but summarily, cut out the kinks.



The Crook and knave may smirk at us.

Coal Institute on Pacific Coast

A recent issue of *Coal Age* called attention to the matter of organizing a coal-mining institute to comprise the State of Washington and the Canadian fields adjacent to that district. A number of inquiries were sent out by the editor, asking the opinions of prominent mining men in reference to the advisability of such a move. The consensus of opinion in the State of Washington is unanimous in favor of such an organization. The Canadian replies are about fifty-fifty; that is, half for and half against.

It would seem from this investigation that an institute should be organized in Washington and that the Canadian fields for the time being should be left out. At a later date some of the Canadian districts might be taken in if the operators in those fields felt that their interests would be benefited by such an alliance. Some of the replies received are published here. Those who have not expressed themselves are particularly invited to do so.

J. J. Jones, superintendent, Pacific Coast Coal Co., Newcastle, Wash.—Think it an excellent idea to organize a coal-mining institute of the Northwest. I am highly in favor of the plan and will do all I can toward effecting such an organization. There is no reason why we should not be able to hold a splendid winter convention. Wish you success in the move.

Clarence R. Claghorn, president, Durham Collieries Co., Durham, Wash.—Think a regional coal-mining institute would be an excellent thing, and if the idea takes hold, will be glad to help in every way possible.

M. H. Dickinson, Lidgerwood Manufacturing Co., Seattle, Wash.—Believe that a coal-mining institute on the northwest Pacific Coast would be a good proposition and something that is really needed in this section.

William E. Maltby, superintendent, Pacific Coast Coal Co., Burnett, Wash.—Am heartily in favor of an institute for the northwest Pacific Coast field. Am not in favor of joining with the Rocky Mountain Institute on account of the great distance to travel. Think more good can be accomplished by having a separate institute on the Pacific.

Lowther Ferris, manager, Wellington Coal Co., Seattle, Wash.—If we can do anything to promote and maintain a feeling of harmony among the coal interests of this district you may rest assured of our best efforts.

Edwin Husband, general superintendent, National Coal Co., Cumberland, Wash.—Am sure that a coal-mining institute such as you suggest would be of immense value to the whole of the mining community of the Northwest. Such an organization would have the active support of my company as well as that of myself. Will cooperate in every way possible.

Stephen H. Green, president, National Coal Co., Seattle, Wash.—Believe such a move would be a good thing for the mining business, and especially so in relation to the coal mining of this district. Have not been here long, but have found quite a lack of cohesion among the mining officials. Having been connected in the East with associations where meetings were held and ideas exchanged, I realize fully the beneficial results that can be attained by such means. Personally I would be pleased to see such an organization perfected in this particular district.

Edward Knoble, sales manager, Wyoming Shovel Works, Tacoma, Wash.—Although we are not engaged in actual mining, I fully believe that an organization separate from the Rocky Mountain Institute would be most advisable. This section is of such consequence and is so remote from other fields that to realize fully the benefits of such an organization a separate institute seems necessary. Associations in other lines out here local to the territory develop keen activity and do a lot of good.

D. S. Hanley, vice-president and general manager, Carbon Coal and Clay Co., Bayne, Wash.—The coal industry in this state for the past few years has been in a stagnant condition, mainly due to lack of market. An organization such as is suggested would do much to relieve the present conditions. If all members would take a real interest and attend the meetings of a live coal-mining institute, many problems now confronting us could be discussed and threshed out to a satisfactory conclusion. This company is not only willing but anxious to do everything in its power either individually or collectively to bring about the desired result. You can count upon our support.

Ralph W. Mayer, Roslyn, Wash.—The idea meets with my hearty approval. Will be pleased to help carry the matter to a successful conclusion.

A number of letters were received from coal-mining men in the nearby Canadian fields. Here are a few:

B. Canfield, colliery manager, Crow's Nest Pass Coal Co.—Believe that a coal-mining institute would be of much benefit to the industry in Washington and Vancouver Island, but would be of little benefit to this locality, as we are situated over 500 mi. from those fields. Furthermore, practically all of the coal-mining officials around here are members of the Rocky Mountain Coal Mining Institute.

Thomas Graham, chief inspector of mines of British Columbia, Victoria, B. C.—The western branch of the Canadian Mining Institute holds a winter and a summer meeting, one devoted to metalliferous mining and one to coal mining. The Rocky Mountain branch of the same institute covers the same ground for Alberta and the Crow's Nest Pass field in eastern British Columbia. Consequently, I do not think there is any present need for the organization of another institute within this field.

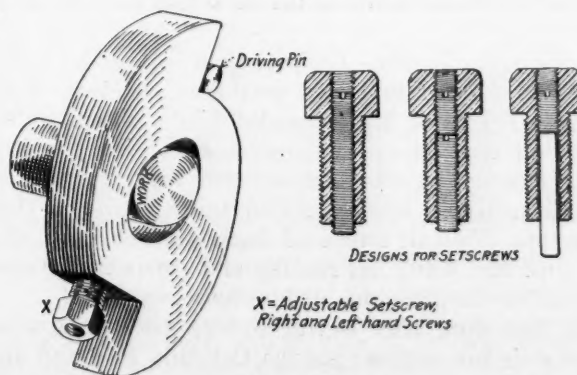
J. H. Cunningham, manager of the Canadian Collieries, Ltd., Ladysmith, B. C.—My opinion is entirely favorable to the proposal. Both of the mining organizations now existing in British Columbia are interested chiefly in metal mining and do not touch deeply on the problems peculiar to the coal industry. This is not a reflection of the work that is being done by either of these bodies, because they are compelled to cater to the wants of the largest number of their supporters. It seems to me, therefore, that an organization which would devote its energies entirely to the coal industry could be made of great benefit to the coal-mining men of the region. Why burden it with such a cumbersome name? Would not Pacific Coal Mining Institute be just as expressive.

As already stated the foregoing letters lead us to believe that opinion in favor of such an institute in the State of Washington is unanimous, but that it is doubtful whether British Columbia should be included. Perhaps the Vancouver field would want to unite with Washington, which matter can be decided later.

Every mining man in the field who has not already expressed an opinion is earnestly requested to do so. If the movement is worth while—and it seems to be—then let's put it across in proper shape. If there is an encouraging response to this article and such replies are favorable to the plan, *Coal Age* will send out personal communications to all who are interested. The answers to such communications will permit of the formation of an organizing committee, which temporary body will arrange for and call a convention, notifying all charter members of the proposed action.

Safety Lathe Dog

In the dog here illustrated and described by G. C. Lawrence in *American Machinist*, the setscrew is made adjustable for length to accommodate work of different diameters and at the same time keep the head well down



SAFETY LATHE DOG

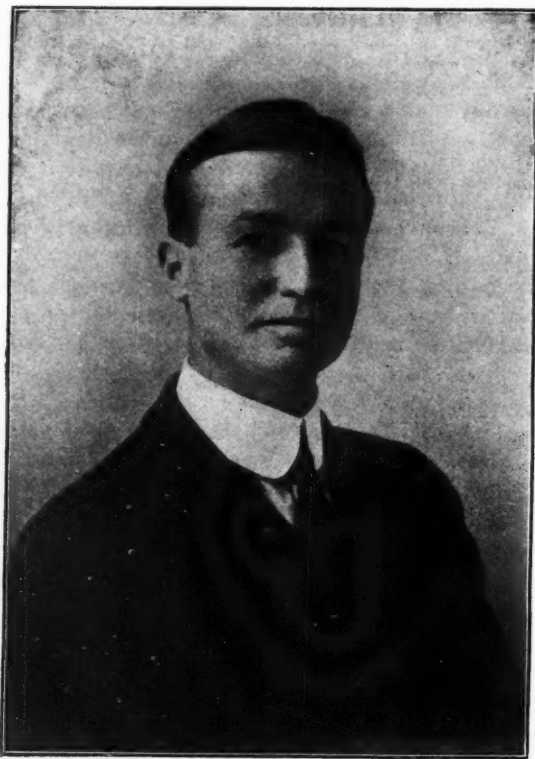
behind the safety projection. Mr. Lawrence found this telescopic arrangement convenient in adjusting the length of driving pins.

Who's Who In Coal Mining

Alfred C. Watts

Much of the growth and success of the West are due to the brains of the men who have gone out there from the East, and be it said in honor and justice to these pioneers, that native sons of the soil have not excelled them in their loyalty to the states of their adoption. A. C. Watts, the present chief engineer of the Utah Fuel Co., is one such. In fact, Mr. Watts has absorbed so much of the West, or the West has absorbed so much of him, that there are no earmarks remaining to identify him as a native of Newark, N. J.

Born in 1873 and descended from a fine line of good old Scotch ancestors, Alfred felt the call of the Rockies early in life and struck the trail straight to that center



A. C. WATTS
Chief engineer of the Utah Fuel Co.

of mining intelligence—Golden, Colo. Here he settled down and refused to budge until the president of the Colorado School of Mines handed him a sheepskin roll signifying that he was no longer an ordinary citizen, but a mining engineer clothed with the right to tack an E. M. after his name whenever and wherever he chose to do so. This all happened back in 1902, and since that time Mr. Watts has steadily and persistently helped to illumine the profession of his choice.

His first work after leaving college was in the capacity of assistant engineer for the Colorado Fuel and Iron Co., and later he was division engineer of the same corporation in charge of the mines in and around Walsenburg, Colo. In 1907 he left the Colorado field to become chief engineer of the Utah Fuel Co., and not even the new kinds of permissible safety powders

have been able to dislodge him from the berth he holds. For a decade Utah mining methods and A. C. Watts have been synonymous. He has given the best in him to the coal industry of the far West, and no one who knows will deny or question the fact that the mining game is far better because of the service he has rendered it.

Some men are engineers by chance. Many are forced into the work by circumstances. A. C. Watts is an engineer by temperament, possessing that type of mental organization that makes a man both patient and analytical. He always has been and is still a deep student of mining practice. He is the sort of man who is not satisfied to bind himself hand and foot with the chains of precedent and tradition. Just because a method worked yesterday is to him no proof that a better plan cannot be worked today.

Mr. Watts' experience comprises the laying out of many mines and the planning of several towns. His schemes of development have been adopted in practically all the mines of the Utah Fuel Co. In addition he has had charge of all improvement work for the latter concern.

He is president of the Rocky Mountain Coal Mining Institute, secretary-treasurer of the Utah chapter of the Colorado School of Mines Alumni, member of the Utah Society of Engineers and a member of the Salt Lake Transportation Co. For years Mr. Watts has contributed interesting articles to *Coal Age* and other technical papers. In this issue we are printing the first of a series he has written on "Mining Methods in Utah." These articles will show better than we can tell the breadth of his technical practice and his ability as an engineer in the construction and practical development of coal mines.

Modest in successful accomplishment, unassuming in manner and square in his association with others, Mr. Watts has easily surrounded himself with an army of friends who respect his capability as a leader in the line of work he has chosen and admire him as a man.

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Cement Gun in Mining Work

The American Zinc Co., of Tennessee, purchased a cement gun to cement the bottom of a creek wherein crevices occurred which let water into the mine workings. That work has not been begun yet owing to the water in the creek being too high, but probably it will be started at an early date.

In the meantime the gun has been used to cover many crevices in the mine where water entered during rainy periods. The procedure has been to cover a crevice with triangular mesh wire, fastened along the edge of the crevice with pieces of steel, small rocks being used inside to give backing to the gunite. Then with the gun mixture of cement and sand spread over the wire, it has resulted in making the crevice water-tight. The gun will not work against flowing water, so the crevices must be taken when they are dry.

The gun has been very useful in finishing concrete bulkheads, making them water-tight all over and especially joining them to the sides of the drifts. Also some encouraging work has been done by cementing cracks in the roof of the mine which threatened to enlarge and cause slabs to fall.—*Engineering and Mining Journal*.

The Labor Situation

General Labor Review

The making of labor history is to the mine owner distressing and impoverishing and to the mine worker little else but disastrous. It is therefore a happy fortune that this week there has been but little history to record. The details of disorder to be given hereafter are mere local trifles, easily forgotten and not of far-reaching importance.

But first, reference should be made to the labor shortage, especially in the Connellsville regions, where the condition has been aggravated by the hot weather which, while it may drive the miners into the mines, tends to keep the coke drawers in their homes.

The anthracite region is quiet. The strike of the miners at the Herbein colliery at St. Clair, who struck because of a demand by the motormen for increased wages, has been called off by the union after an investigation that revealed that the men were entirely in the wrong. As a result 1,000 men went back to work.

Union for Stationary Engineers at Mines

Stationary engineers in the anthracite region to the number of 5,000 have perfected an organization with the object of demanding shorter hours and higher wages. This union is the result of a feeling on the part of the engineers that their interests were ignored during the recent negotiations with the miners for a new working scale.

Strikes are threatened in Northumberland and Schuylkill Counties, the union men purposing to quit work in order that those who have deserted the union may be compelled to pay up their delinquent dues. Such a suspension of work is called a "button" strike. A strike of this character at the Silver Creek colliery of the Philadelphia & Reading Coal and Iron Co. occurred July 31 and laid 1,000 men idle.

The farm laborers of the Delaware & Hudson Co., nine in number, at Larksville have struck for an increase in wages of 5c. an hour.

In the Pittsburgh district there is a continuance of the labor shortage, but no labor troubles. In Westmoreland County, in order to meet the restricted labor market, about 50 negroes have been brought from Florida as an experiment. They are already working in the mines.

Varying reports come from Somerset County. The Knickerbocker Smokeless Coal Co. declares that it is progressing satisfactorily in its fight against the union at Hooversville and is increasing its output in spite of the parades and the attempts at coercion of the union men. The Baker-Whitely Coal Co., near-by, is doing likewise.

James Feeley, of Dunlo, district-board member of sub-district No. 3, pretends to deny these statements in the "Johnstown Democrat," though, after all is said, he does not actually deny them: "The Hooversville companies have put out men in the district to spread reports that 125 of the miners have returned to work. All we will say in answer is this: When the strike at Hooversville is settled, we will announce the fact through reputable newspapers, and until that announcement is made, miners in other places must understand that the strike at Hooversville continues." This is an evasive way of meeting a definite statement.

Only Checkweighman Issue Is Now Insisted On

The Victor Coal Mining Co. men at Hollsopple have returned to work, being conceded permission to put a checkweighman on the tippie. James Feeley, whose remarks have just been quoted, declares the miners "made no charges of dishonesty" against the company, but felt they were entitled to have someone on the tippie to represent their interests.

Demands for a checkweighman, check-off and mine committee were made by the United Mine Workers of America on the manager of the Pretoria mine. This mine was just transferred from the Wentz Smokeless Coal Co., having been formerly worked by the J. B. Kennerly interests, of Philadelphia, Penn. The demands were refused, and the mine has been idle since the middle of last week, 275 men being involved. Mr. Kennerly is president of the Valley Smokeless Coal Co., which operates four mines in Cambria and Westmoreland Counties.

The miners of the C. A. Hughes Co. at Cassandra are on strike over the company's refusal to pay yardage on headings and back headings. The union hopes to win this strike

soon. The ending of the Victor strike with only one concession—the checkweighman—out of three—checkweighman, check-off and mine committee—seems to show that the miners are likely to be insistent on only the first of the three demands.

Eastern Ohio Miners To Erect Labor Temple

In eastern Ohio the miners are giving their attention to the construction of a Labor Temple, which will contain offices, an auditorium, clubrooms and a central cooperative store. The union members are required to pay 5c. a week toward the building fund. The cost of the building will be from \$2 to \$2.50 per capita. It will be erected in the central part of the subdistrict, which most interpret to mean Bridgeport, but a referendum is being taken to decide what location is preferable.

Percy Tetlow, a union man, is endeavoring to be elected to the United States House of Representatives for the 18th district. The men at Lydia mine, Maynard, Ohio, operated by the Pursglove-Maher Coal Co., have been on strike, demanding that they be hauled into the mine every morning. For several days the men remained idle, but finally they agreed to leave the matter to the grievance committee, as indeed their contract demands.

West Kentucky Mine Workers Again Vote Nay

The mine workers of district No. 23, the western Kentucky field, voted a second time on Wednesday, July 26, on the question whether they would ratify the contract approved by the operators, the joint subscale committee and the international committee of the union.

It is estimated by H. H. Vincent, of Central City, secretary of the union, that only about one-half of the 5,000 qualified voters cast their ballots. According to information received by Vincent from scattered districts, the vote has gone against acceptance of the proposal. The ballots have not yet been assembled for counting. The strike has been in effect since May 15, and it is said that numbers of the men have left to take employment elsewhere.

In eastern Kentucky 300 miners of the Fork Ridge Coal and Coke Co. are out on a strike, which is said to have followed the demand of the men, presented some time ago, for an increase of 10c. on each car of coal mined and an increase of 10 per cent. in the wage of laborers other than miners. It is said that the trouble was precipitated by the company increasing the size of the cars without advancing the rate of pay. The men are preparing to affiliate with the United Mine Workers. They are acting independently of workers elsewhere in the district.

In the State of Indiana, according to William Raney, of Princeton, a member of the executive board of the United Mine Workers of America, 20,000 union coal miners will strike if the operators of Indiana persist in their attempt to force the men to procure a certain type of electric safety lamp.

The recent extension of the terms of the McAlpin Agreement to the Southwestern coal territory has not been pleasing to the Oklahoma operators, who declare that it will add from 12c. to 15c. a ton to the cost of producing coal. It was the firm resistance of the Oklahoma operators to the mine workers, practically under the leadership of Alex Howat, which caused the acceptance by the mine workers of Clause 6 of the McAlpin Agreement.

By this understanding, which has the full approval of the international board, no change may be made in the district or subdistrict agreements whereby the cost of coal will be increased or the earnings of the miners reduced. Work will continue without delay, though the agreement between miners and operators expires Aug. 1 and will be replaced merely by the protocol just signed at Kansas City.

Washington Miners Will Now Make Contract

At a convention of district No. 10, comprising the unionized Washington field, held on July 15, the mine workers of that district authorized the officials to negotiate with the coal operators of the State of Washington for a scale to replace that soon to expire. The delegates present represented the entire state, or about 4,000 coal-mine workers. The adopted report of the committee appointed from the four districts of the state provides that wage increases be demanded approximating those recently granted in the McAlpin Agreement to the districts east of the Mississippi River.

The scale committee's work was complicated by the fact that in only two Washington fields is payment made for coal on a tonnage basis. These are the Roslyn-Cle Elum field, where the rate during the last two years has been \$1 a ton, and the southwestern Washington field. In the King and Pierce County fields west of the Cascade Mountains, coal is mined on what is termed the yardage basis, at a stated price per cubic yard, and prices vary for different camps and for different mines and veins in the same camp.

The demands of the mine workers, when approved, will be submitted to the Washington Coal Operators' Association, which represents the employers. The wage scale and the working conditions that are agreed upon by the operators' association and the representatives of the union will then be submitted to a referendum vote of all the local unions. However, it is definitely understood that the mine owners are unwilling to grant any advances in pay. Pending the negotiations of the new agreement, work will be continued under the old contract, which expires on Sept. 1.

A dispute which has prevailed for some time between the miners and mine operators of district No. 18 of the United Mine Workers of America, which embraces all the large coal mines of Alberta and eastern British Columbia, appears likely to result in a general strike. Some time ago the men asked for an increase of 10 per cent. on account of the enhanced cost of living. The operators refused this demand, but offered to compromise with an advance of 5 per cent. now, promising a further increase of 2½ per cent. on Mar. 31. This proposition was not accepted, and on July 24 the men employed by the Crow's Nest Pass Coal Co. at Fernie, B. C., quit work. It is feared that the strike will extend to the whole district.

Southwest Freight Rate Filed

Much apprehension has been felt in the Southwest regarding the new freight rate filed by the Chicago & Alton Railroad Co. between Springfield, Ill., and Kansas City. Reference to an editorial in this issue, entitled "Ultimate Outcome of Unionism," will throw some light on the attitude of labor toward the new tariff, the documents here quoted having relation solely to the views of capital. It is evident that in the Southwest as in Ohio, the union is going to interest itself in freight rates. In fact, the Interstate Commerce Commission may find it a principal party at interest, as indeed is only fair.

The following letter has been sent out by I. M. Fleming, the president of the Southwestern Interstate Coal Operators' Association to all the operators immediately threatened by the reduction in the Kansas City freight rate:

Attention is hereby called to the fact that the Chicago & Alton Railroad Co., in order to secure a large contract for screenings in Kansas City, has filed with the Interstate Commerce Commission (Chicago & Alton, Supplement No. 6 to I. C. C. A-764) a tariff effective Aug. 22, making a rate on screenings from the Springfield, Ill., district to Kansas City of \$1.25 per ton. This is a reduction in the freight rate per ton of 65c.

The effect of this rate, with the low cost of production in Illinois as compared with the high cost of production in the Southwest, is obvious to every member of the association. As the result of the filing of this tariff similar rates will doubtless be filed by other "Illinois-to-Missouri River" roads. Consequently all the Missouri River points and intermediate territory will receive this rate and the tariffs will be lowered to points beyond.

On behalf of all members of the association, including yourselves, we telegraphed the Interstate Commerce Commission urging the suspension of this Chicago & Alton tariff, pending investigation on the part of the commission, and a copy of this telegram is hereby appended. The United Mine Workers of America filed a similar protest.

We have also asked the carriers who serve the Missouri, Kansas, Arkansas, Oklahoma and Iowa coal fields to file a protest with the commission, for the reason that the extended application of this rate will break down the entire rate fabric and will have a tendency to destroy all the coal properties of Iowa, Kansas and Missouri and to materially increase the competition of Arkansas and Oklahoma, as the markets of these latter states will be curtailed. The tariff will so reduce

their business that their properties will be practically ruined. We propose to ask the miners' district officers to have each local union pass a resolution of protest, sending copies of such resolutions to the Interstate Commerce Commission in Washington. It is our desire that every member of the association will get the commercial club of his community which is dependent upon the coal industry to file a similar protest. If you have no commercial club, get your merchants together and call on them to do the same.

We also desire a copy of all the protests, to turn over to the parties who will appear for us before the Interstate Commerce Commission. Time is essential, as we have only two weeks to do what is necessary in this matter, and we urgently request your immediate and entire coöperation.

In addition to this, we ask you to write a letter to each of the senators and representatives from your state in Congress, requesting them to take the matter up with the Interstate Commerce Commission.

The following telegram, signed by 143 coal-operating companies, was sent to the Interstate Commerce Commission, July 20, 1916, from Kansas City:

Information has been conveyed to us that the Chicago & Alton Railroad Co. has filed with your commission this week a tariff, the number of which we do not know, on coal from the Springfield coal-producing district of Illinois to Kansas City. This tariff specifies a rate of \$1.25 per ton, the present rate being \$1.90.

The rate of \$1.25 per ton was named during recent negotiations between the coal operators of the Springfield district and the street railway company of Kansas City, and a five-year contract was entered into between these parties, predicated upon this rate being filed and confirmed by your commission. This rate was evidently named so that the street railway company could purchase this tonnage. Such a rate, in effect, discriminates against the coal-producing fields of Missouri, Kansas, Arkansas, Oklahoma and Iowa.

The effect of this rate and its probable extended application by other Illinois-Missouri River lines to other Missouri River points will be to render the coal properties of those states valueless, and will throw out of employment thousands of laboring men who own their own homes in those districts. This will be the immediate effect on intermediate properties in the Missouri and Kansas competitive field.

The subject is one of such vital importance, not only to the employers who have their money invested in these properties, but also to the men employed and the hundreds of small communities dependent upon this industry, that we respectfully urge the suspension of this rate, pending a complete hearing of the case and final decision on the subject by your honorable body.

Recent Legal Decisions

Effect of Mine Foreman Law—An operator of a Pennsylvania mine cannot escape liability for injury to a person while in the mine seeking employment under invitation from the company, through being struck by a car moving by gravity, on account of negligent failure to warn him of the danger which was not apparent to him, on the ground that the mine was under the charge of a certified mine foreman; there being no negligence on the part of the foreman in the performance of his statutory duties. (New York Court of Appeals, *Bigus vs. Lehigh & Wilkes-Barre Coal Co.*, 112 Northeastern Reporter, 473.)

Employees Who Are Not Fellow-Servants—Men employed in clearing a mine after coal has been blasted down are not fellow-servants of an operator of a coal-undercutting machine, within the principle of law that an employer is not liable for injury to an employee due to negligence of a fellow-servant. (United States Circuit Court of Appeals, Eighth Circuit, *Owl Creek Coal Co. vs. Goleb*, 232 Federal Reporter, 445.)

Sale of Second-Hand Equipment—On sale of second-hand coal barges there was no implied warranty on the part of the seller as to their condition except that they were reasonably well adapted to the purposes for which they were intended. Renewal of purchase-money notes or payment of the price after discovery of defects in the barges constitutes waiver of any claim of the buyer on account of such defects. Unseaworthiness of the barges discovered a year after their purchase and after several trips had been made with them is no valid proof of their condition at the time of the sale. (United States Circuit Court of Appeals, Sixth Circuit, *Marmet Coal Co. vs. People's Coal Co.*, 226 Federal Reporter, 646.)

Editorials

What Are Fair Freight Rates?

The question, What are fair freight rates? seems to be agitating everyone in the coal-producing business just now, and some are answering it as seen from one point of view while others, looking at it from a completely opposite quarter, reply to the question in an entirely different manner. It is hard to forecast how the Interstate Commerce Commission will view the matter. We hope that one aspect at least will be overlooked—one that probably has not been altogether forgotten in the past—namely, practical politics.

It has been hard to shut this viewpoint out even when the question to be decided was simple and obvious, for instance, Whether freight rates should or should not be increased in all lines of transportation? Despite the reasonableness of such an increase and the severe need of it for the development of the country and the railroads, the Interstate Commerce Commission has been slow, in the face of an uninformed popular clamor, in doing what justice clearly demands. Let us hope that clear and cool reason and not clamor will settle the question of fair coal freight rates to the best interests of the country and of the industry as a whole.

It seems a simple matter to the people of Pennsylvania and Ohio—a mere question of coördinates. They have it down to a mathematical science—this determination of rates. And when you have written $bx + C$ you have a simple line in Cartesian coördinates that one cannot answer; x is the ton-mile rate that should be uniform everywhere, b is the distance the coal has to be hauled and C a constant for gathering, distributing and billing. These theorists might be called the “physiocrats,” with a due apology to the followers of the long deceased François Quesnay for the misuse of the word coined by P. S. Dupont de Nemours to distinguish them from other economists.

But there are others who contend that the ton-mile rate should have some relation to operating and construction conditions, that roads should charge according to the difficulty of the service to be rendered and to the amount of traffic that might be expected on any road. They would make rates vary with the flatness of the country or at least its suitability for railroad location, the cost of making the cuts and fills, erecting the bridges, entering the cities and purchasing the land. These men follow the “physical valuation” school of Senator LaFollette.

In the early days of political economy and even in these days wherever the science of political economy has been little studied, those who have considered the freight differentials have looked upon the subject as wholly a matter to be considered autocratically—just as if the people of the United States had a brand-new country to deal with what was to be scientifically administered on an *a priori* consideration.

But older countries have grown to look upon vested interests with some care and favor. These interests are manifold. They are not the rights of the wealthy man

only, but those of the applewoman on the corner, the hewer in the coal mine and the farmer on the traveled road. These people have their rights to the maintenance of things as they are. Certain freight rates may have been wrong at the first, but on them have been built villages of homes, mines, railroads and subsidiary industries in towns near and far.

According to some people's views to change them may constitute a wrong greater than was perpetrated when the rate was first imposed. The man who with good faith inquires about the price of coal in the market, the freight rate to the city and the cost of production and decides he can operate has a good argument for the continuance of the freight rate granted. If he has guessed the cost of production or the market price wrongly, and finds he cannot pay the freight, it does not follow his freight should be reduced. In that event he must take his medicine; but to many it does seem clear that having summed up all the conditions rightly, he should not be deprived of his capital by a rearrangement of rates to suit the “physiocratic” or the LaFollette manner of calculation.

■

Ultimate Outcome of Unionism

The progress from absolutism to unionism in any industry is fraught with danger. We have never for one moment wondered that operators opposed the growth of the union. Violence and disorder are its parents, and for a long time unreason and impatience will be its progeny.

But it does not altogether follow that the end of unionism will be as painful as its beginning. Like a human being the union learns by experience. It lashes itself against unfortunate circumstance and finally realizes that it, like capital, is the sport of economic laws that cannot be evaded.

The young men and the foreigners who are kept by their lack of knowledge of English from an understanding of true conditions are the most dangerous elements in almost every union—young men simply because they have not had time to learn wisdom, and foreigners because, not knowing our language, it is hard to replace their uninformed suspicions by the conclusions of a mature judgment.

The socialists have been divided by the adherents of that political creed into the intellectual and the active groups. Frequently the rank and file fall amuck of their intellectual leaders, because the knowledge of true facts possessed by the latter is apt at times to overpower their bias and make them see economic relations with some degree of clarity, which is not the case with the uninformed socialistic proletariat.

The union also faces these periods, when the workingmen who believe that profits are boundless and not dependent on steadiness of operation and economy rise and expel the more careful mine leaders who know that the employer is in many cases not making profits and

that where he is, those profits would be but small if divided among his many employees.

Unionized men are voters, and like the free men of any country with a representative government, they will learn after a while how to use their vote. The time will not be so short as we might wish, but still the passage of one generation may work wonders. The change, which will be made quite rapidly under unionism, can never come about so long as industry remains under the absolute control of the mine owners and their managers.

Perhaps this will be regarded as visionary. It will be said that union literature furnishes no such assurance and, in truth, much hope of development cannot be gained from reading a union paper like the *United Mine Workers' Journal*. In such a publication there is room for nothing but the class war. It would not be politic for a paper that must please all union men or cease business to mirror to the mine workers all the differences existing between the employees of coal corporations in various sections of the country. But these disagreements exist nevertheless, and the operators are often more united in sympathy and interest with their own men than their men are with the men of another state.

Nevertheless the fact remains that all the union leaders and most of the rank and file discovered long ago that business is a contest in which capitalist is usually pitted against capitalist and workman against workman and that the only way to secure success is for each group of men to back their own group of capitalists against other groups of men and capitalists or else, better yet, to maintain by firm defense the existing conditions to which life has been adapted after periods of contest and flux.

On the whole this maintenance of the existing status is the best solution for the workingman, though it is devoid of excitement and change. Unfortunately this status is not always being maintained with steadiness, and raises in wage in union sections, justified by changes in the cost of living and by wage-rate advances in other industries, do not always spread into nonunion districts.

This wage status is well worthy of a fight, for without it solidarity of men and operators cannot be maintained. But the freight status, as the miners are learning, is as important or more important than that of wages, for as the price of transportation is greater than the wage paid for mining, it is possible to cut it far more. No miner could have his wages reduced 65c. per ton for he would have nothing left. Most miners would be paying for the privilege of being allowed to mine coal if their wages were reduced by that figure.

But while it is impossible to lower wages 65c. per ton, freight rates can be so lowered, and it is seriously proposed that the freight rate from the Springfield, Ill., field to Kansas City be reduced by that amount so that large shipments of screenings may be profitably made to that shipping point over the Chicago & Alton R.R. Moreover, it is feared that the lowered rate will cause reductions on other roads in Illinois and on the Missouri River, possibly relieving from the burden of high freights all but the local mines, which normally should supply all the local markets.

As a result of a careful study of the situation the intelligent union leaders of Missouri, Kansas, Arkansas, Oklahoma and Texas are pitted against those of Illinois

in their desire to maintain the status of their miners. We quote their statement in full:

Interstate Commerce Commission, Washington, D. C.

We the presidents and secretaries of the United Mine Workers of America of Districts 14, 21 and 25, representing 35,000 members of our organization employed in the mines of the coal operators producing coal in Missouri, Kansas, Arkansas, Oklahoma and Texas, formally protest against the rate of freight which we understand has been named by the Chicago & Alton Railway Co. Tariffs, we learn, have been filed with your commission specifying \$1.25 per ton as the freight on coal from the Springfield, Ill., district to Kansas City, Mo., which is a reduction of 65c. per ton from the former rate. This rate in all probability will be extended to include all points on the Missouri River and stations intermediate thereto.

We protest against this change on the ground that such a rate is practically a discrimination against our employers and against our employment and because it will in effect ruin the coal industry of the states mentioned, and in doing so will destroy the value of our homes and force us either to find employment in other vocations, or at an expense which we can little afford to move to other states in order to secure employment in the only industry regarding which we have any knowledge.

We earnestly urge and request that your honorable body will not permit this rate to become effective until you have had a formal hearing and learned all the facts. We earnestly request that you will not only take into consideration the rate itself, but also the position in which it will place ourselves and our families.

THOMAS HARVEY,
Secretary, District 14.
R. F. ROSS,
Secretary, District 21.
GEORGE HAPPLE,
Secretary, District 25.

ALEX HOWAT,
President, District 14.
JACK WILKERSON,
President, District 21.
GRANT PARKER,
President, District 25.

There will be poverty, idleness, waste of property, loss of homes—all the sorrows of industrial war—till operators learn that new shipping territory must not be sought by juggling either wages or freight rates. And this is just as true as the statement that is appearing in all the papers that war will continue as long as nations hold it as a natural aim to aggrandize themselves by absorbing one another.

A few cents increase such as the proposed advance of 15c. in West Virginia will not bankrupt a state or destroy its industries, but no one can deny that it will have important and serious consequences and is a measure of doubtful advantage to the country as a whole. There are some parts of West Virginia, however, for which little sympathy can be shown. They have refused to give wage increases comparable per ton with those granted elsewhere, and they are entitled to learn to what a misfortune a like illiberality in others would subject them.

Their miners may be making a fair living. That may be well granted, but so are all miners. There is no reason why they should not make generous wages, but the operators of southern West Virginia should not be satisfied with paying a good wage. They would have done well to have proved to the hilt their constantly repeated argument that "unionism helps no one" by giving an increase per ton as liberal as that granted elsewhere.

This they have not done as far as can be discovered, and little sympathy can be extended to them if the Interstate Commerce Commission decides in their disfavor. For those in the Fairmont, Kanawha, upper Kanawha and Winding Gulf sections, where increases have been more liberal, a better fate is to be wished. It is to be hoped that in future, with or without union pressure and with or without a shortage of labor, they will keep the balance even by giving wage increases equal to those given elsewhere as far as they can determine that equality.

Department of Human Interest

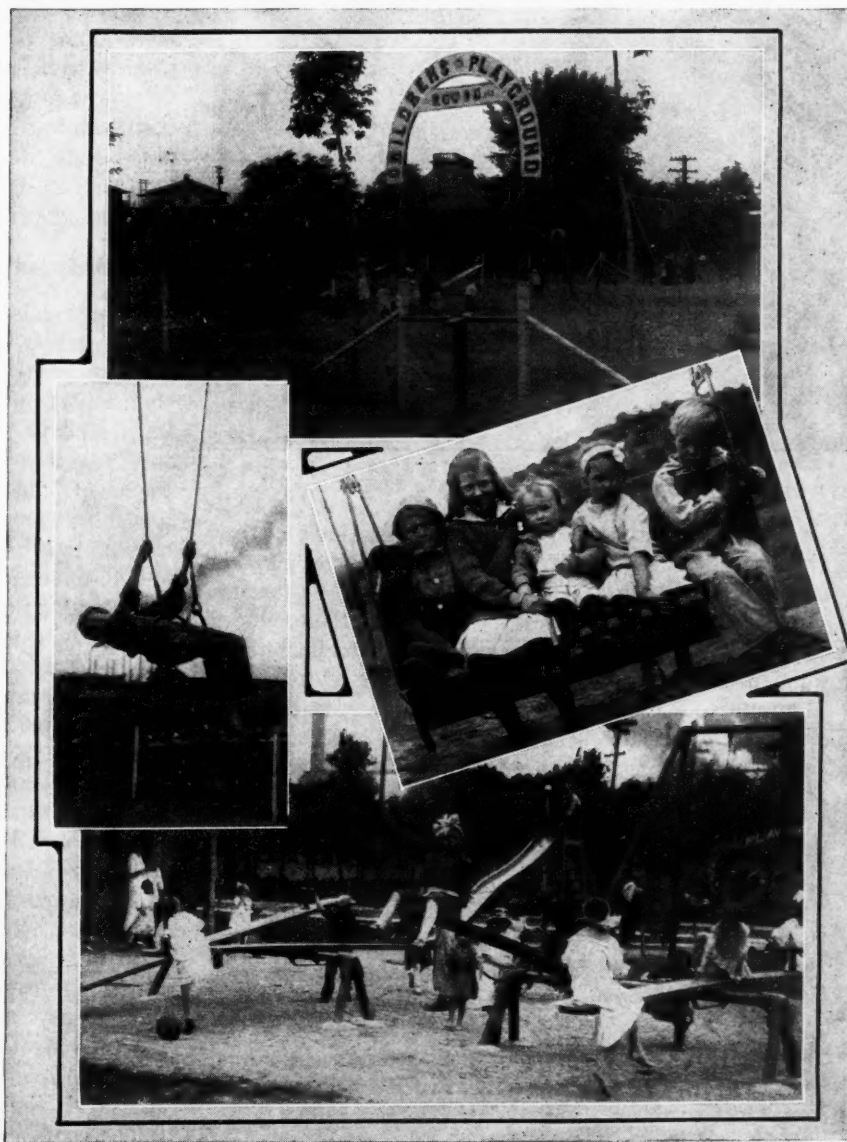
C. F. & I. Extends Welfare Work

A corps of trained women workers along medical, social and domestic lines is to be put to work in the coal- and the iron-mining villages and the steel plant of the Colorado Fuel and Iron Co., Aug. 1. This announcement is made in an issue of the company's Industrial Bulletin dated July 31. The system just initiated, which is to be extended widely throughout the properties of the corporation, is due to the combined action of the Colorado Fuel and Iron Co., the Young Men's Christian Association and John D. Rockefeller, Jr. The new arrangement goes into effect with five women workers, each one an expert, in the field. Two of the corps will have their headquarters at Primero, where a dispensary erected by Mr. Rockefeller has just been completed. These young women will extend their activities through the closely adjacent camps of Primero, Frederick and Segundo. Of the two, Miss Clare V. Espe is a trained nurse and will do dispensary and visiting nurse work in connection with the mine physicians and the regular medical department of the company. Miss Miriam C. Dawley is an experienced social and domestic science expert and will work under the direction of the Y. M. C. A. At the iron-mining villages at Sunrise and Chicago, Wyo., Miss Eda May Gallaher will for the present perform the double duty of dispensary and visiting nurse and social worker. She will have her headquarters in a mining-town dispensary also erected by Mr. Rockefeller. Miss Mary Skrifvars has been employed as nurse and social worker in the Minnequa Steel Works at Pueblo. She will make her headquarters at the works dispensary, which is operated in connection with the company's main hospital. At the playgrounds near the steel works provided and equipped by the company for the children of its employees, Miss Dorothy Brown is employed as instructor for the children. She is an exemplar of the newest type of sociological expert—a trained playgrounds teacher.

In securing the services of women workers at the coal mines, iron mines and steel works, the company was actuated largely by the need of a more efficient and intimate medical and social service. It became apparent that the medical department, already well equipped for dealing with cases of illness and accident, would gain greatly in efficiency by having trained nurses for dis-

pensary work and such as were fully competent to provide home instruction in matters of sanitation and hygiene.

At the same time it was thought that the work of the Y. M. C. A., inaugurated in most of the camps at the beginning of the present year, could be rendered far more valuable if it could be intimately related to the



GLIMPSES OF PLAYGROUNDS PROVIDED BY THE COLORADO FUEL AND IRON CO. FOR THE CHILDREN OF ITS EMPLOYEES

homes of the miners by the services of trained social workers. The matter was given earnest consideration by the company officers, by the management of the Y. M. C. A. under Secretary A. B. Minear, and by John D. Rockefeller, Jr. Mr. Rockefeller already had donated the two new dispensaries at Primero and Sunrise. He became intensely interested in the matter of securing visiting nurses and social workers and volunteered to personally pay the salary of one of the women workers.

The others are paid by the company, with the exception of Miss Dawley, whose compensation is provided by the Y. M. C. A.

The nurses at the dispensaries will be available whenever needed for cases of illness or emergency operations. They will also visit the homes of the miners, make the acquaintance of the women and children and give them sound advice on matters of cleanliness, hygiene and housekeeping. Among other things, they will supervise the care of the teeth of the children.

They also will encourage the miners' wives to take their children to the Y. M. C. A. buildings for bathing facilities at certain times when the buildings will be



GROUNDS OF MINNEQUA HOSPITAL, PUEBLO, COLO.

open for such purposes. The first indications of contagious disease will be watched and quarantines imposed where necessary. In this way it is believed that the possibility of epidemics in the camps will be further reduced. The nurses also will direct their attention to home sanitation, including garbage disposal.

Working side by side with the visiting nurses, the Y. M. C. A. social workers or community secretaries, of whom Miss Dawley is the pioneer, will give attention to the social and religious needs of the families in the camps. It is planned thus to extend the influence and benefits of the Y. M. C. A. beyond the membership and even beyond the male residents of the camps.

First-Aid for Dislocations*

BY JOHN L. BOARDMAN

A joint is where two or more bones are joined together. The bones forming a joint are held in place by means of strong white cords or ligaments, which span it and form a sort of casing over it being attached to the bones and muscles on either side. When a limb is subjected to blows or twists of sufficient violence, these ligaments are torn loose and shoved aside so that the bones separate or get out of their proper location. The most usual cases of dislocated joints are those of the fingers, thumbs, shoulders, lower jaw and hips. More or less deformity, much swelling and pain and quite often discoloration attend dislocations.

Owing to the delicate nature of the membrane around joints, there are but two cases of dislocation that the first-aid man should attempt to reduce, or put back in place.

These two instances, both relatively simple, are dislocations of the fingers and thumbs and of the lower jaw.

The method of reducing a dislocation of the finger is to grasp the wrist of the injured hand firmly with your left hand, take hold of the end of the injured finger with your other hand and pull straight out away from the patient's hand. If you pull hard enough, the bone will usually slip back into place. The same method is used for a dislocation of the first joints of the thumb; for the third, or hand joint of the thumb it is necessary to not only pull straight out away from the hand, but also to press downward on the second joint while pulling. No bandage is necessary, but the patient should be sent to the doctor if there is much swelling or discoloration.

To reduce a dislocation of the lower jaw, wrap both your hands in several layers of cloth, then place your thumbs well back in the mouth on the lower teeth, grasp the lower jaw with your fingers and press first downward then backward. When you feel the jaw slipping back to place, slide the thumbs off the teeth so as to prevent them being pinched by the jaws coming together. Put on the jaw bandage and send the patient to the doctor at once.

BANDAGING DISLOCATED SHOULDERS AND HIPs

When rendering first aid in case of dislocations of the shoulder, you will find that owing to the pain the patient will not permit you to lift the injured arm much higher than a horizontal position across the breast without bringing the elbow outward from the body. You should, therefore, fold a coat or several jumpers and place them under the elbow, up under the armpit and the forearm, then bring the forearm up across the breast as far as you can without causing the patient pain.

Now place a wide bandage over the front of the elbow down under the pads and up across the back to the top of the opposite shoulder and tie. Next take another wide bandage and tie over the elbow and around the body in such a manner as to pull the elbow in toward the body. This bandage should be quite tight, so as to overcome the tension of the overstretched muscles. Send the patient to the doctor at once.

Nearly all dislocations of the hip are what are known as backward dislocations. In this case the foot of the injured leg is drawn up and turned slightly toward the ankle of the opposite leg; the knee is bent and raised and turned slightly outward; the leg appears shorter than the uninjured one and there is a prominent enlargement back of the hip joint. This is a delicate case to handle and all unnecessary movement of the patient should be most carefully avoided.

Procure a board 1 in. thick and at least 12 in. wide and 8 ft. long. Pad this heavily with folded blanket, folded coats, canvas or other yielding material. Place the patient on the board in such a manner that he is lying on his back, but so that the padding does not bear on the injured joint. Tie a wide folded bandage across the board and chest close to the armpits, another across the board and the pit of the stomach, another across the board and the top of the hips, another across the thighs and the board.

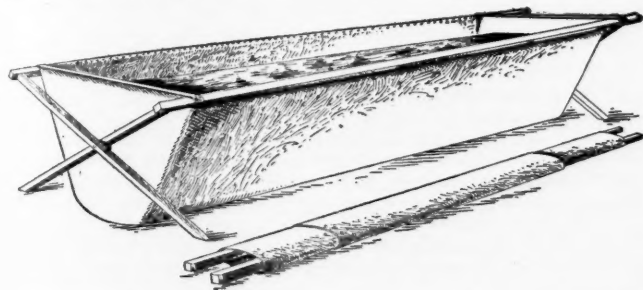
Now fill in under the injured leg and between the legs with folded coats or blankets and tie another wide bandage over the shins and the board and another over the ankles. Treat thoroughly for shock and carry the patient to the doctor without jarring or unnecessary movement.

*From "The Anode" of June, 1916.

Portable Folding Bathtub

Many superintendents and mine foremen have felt that the old washtub as a bathing medium has seen its appointed day and must be replaced with something in which more comfort and a real plunge can be taken. But the conditions are frequently quite unfavorable for the introduction of fixed bathtubs of the regular pattern, and the cost is also considerable.

The folding bath shown in the illustration will fill this mediate position between the washtub and the enameled bath. Those operators who are anxious to advance the welfare of their men might test the idea



FOLDING BATHTUB OF COATED VULCANIZED DUCK
Open and closed

on selected persons, choosing, of course, first of all those who are most to be considered because of long service, model homes or relatively expert occupations entitled to larger consideration.

The bath measures 5 ft. by 27 in. by 16 in. and so is large enough for anyone. It weighs only 15 lb., yet it is strong and durable, suited to a person of any weight. The material used is called by the manufacturers "steelene," but it consists of a closely woven fabric that is practically waterproof, made perfectly nonabsorbent and impervious to water by a vulcanizing process. It is then coated with another outer preparation which protects the material and gives it a strong, lasting surface. There are, however, two types of fabric. The bath can be equipped with an emptying device and outlet tubing.

As the bath rests on the floor, it cannot tilt nor can it be readily overturned. It is well braced with riveted steel. There are no screws to work loose and make the bath rickety. The outfit is manufactured by the Robinson Cabinet Manufacturing Co., of Toledo, Ohio.

The Miner's Social Welfare

BY ERASMUS,

In the matter of welfare work many superintendents receive considerable criticism. Few camps measure up to even a mediocre standard sociologically, and as the superintendent could effect an improvement if he so willed, he must be held responsible to a great extent wherever these poor conditions exist. As long as the mine pays dividends regularly, he is apt to ignore the sociological aspect of camp life.

Many superintendents, naturally, are adverse to court- ing the company's disapproval by pursuing a line of action which they think must necessarily increase the mine expense, and on this ground must be based the chief reason of their apathy toward camp improvement. Our workmen, however, could be helped in many ways and their living conditions bettered considerably without disaster to the cost sheet. Our mines would not have to

be "whited sepulchers"—fair without, but ill-kept and dangerous within. Our superintendents could pay more attention to keeping up the exterior appearances of the mine without thereby neglecting the interior or interfering with the process of getting out coal. It would profit well if all our camps were kept above reproach.

Unless attracted by higher wages first-class men are at most only temporary assets to the superintendent who lacks courage to inaugurate welfare work. In fact, it is difficult to hold help of any kind. Men come and go continually, and this unsettled state of labor is by no means conducive to a regular output. As mines situated near good towns are generally free from such carpet-bagging, and as wages are usually lower, the living conditions must be better. The employees can acquire homes of their own and thus inaugurate a constructive scheme of living.

Some operators are meeting this scarcity of labor by paying better wages, but one raise brings on another while the root of the evil remains untouched. If this increase were spent giving the men and their families more comforts and conveniences, the effects would be better and more lasting.

There is a feeling among many superintendents that their welfare work would be lost upon their men. But there is no reason for their skepticism.

What the miner demands—knowingly or otherwise—is that interest be taken in him. Under such stimulus he will do worlds for himself. If he finds that the company is out for itself alone, he is going to scramble to get what he thinks is coming to him, and that with no good will to his employers. But if he finds that the company has his interest at heart, he will repay in kind.

In every camp there are a few men who try to improve their homes, and if the superintendent would give these his moral support and meet others half way, the remainder of his men would probably fall in line. A few mine props given free and some wire at cost would be all that the men would need to do their fencing. Flower and grass seed would go a long way toward beautifying the camp. The men could be encouraged to transplant shade trees from the nearby woods, and in a short while the camp would take on a new appearance. Another step in the right direction would be for the superintendent to make periodic rounds of the camp, in order to become acquainted with his men and come to look upon them as more than certain numbers on the payroll. With a desire for doing good innumerable opportunities would soon present themselves, and without occasioning such expense as to incur the disapproval of the company.

All conditions, of course, cannot be attacked at once. Start with the small details. The larger problems, such as bathing facilities, sanitation and the like, will solve themselves in time. It must be kept in mind that welfare work does not mean the erection of fine concrete dwellings, the construction of scenic boulevards, expensive water-works, and other great things, although these will probably come in part through the company's own volition when it becomes apparent in exactly what ways the movement is successful.

When once the superintendent has caught the true aspect of welfare work, his skepticism will disappear. He will take pride in his camp. He will add zest to the life of his men and their families, and also he will eventually find that he has increased his output immensely.

Discussion by Readers

Mine Electric Cap Lamps

Letter No. 1—Kindly permit me to refer to the article, "Costs of Operating Electric Cap Lamps," which appeared in *Coal Age*, July 1, p. 17. The article dealt with certain alleged features of the Edison lamp, and although much could be said in respect to the figures given, I only wish to challenge the contention of the superiority of the alkaline cell over the sulphuric-acid cell commonly used in the storage batteries of such lamps.

It is claimed in the article that the alkaline cell of the Edison lamp uses no acid, which, although technically correct, conveys the impression that the old lead-sulphuric acid cell is more destructive of the container and hence less permanent than the alkaline cell of the Edison lamp. Anyone who has had practical experience in handling both of these types of storage batteries knows that the alkaline (potash) solution is as injurious to the person and to clothing as the sulphuric-acid solution.

In paragraphs 3 and 4 of the article to which I have referred, the attempt is made to create the impression that the alleged superiority of the alkaline cell of the Edison lamp over the sulphuric-acid cell of the Manlite lamp led to the replacing of 1,100 lamps of the latter type by an equal number of the former, at the mines of the Keystone Coal and Coke Co., Greensburg, Penn.

Without entering into any controversy in respect to the relative superiority of these two lamps, permit me to correct this unfortunate impression, which is wholly untrue. In evidence of this fact kindly allow me to present for the information of *Coal Age* readers the following true copies of four letters that I have received from the general superintendent and three mine superintendents of the Keystone Coal and Coke Co., who installed and used for two years the Manlite lamps in their mines.

The letters speak for themselves in regard to the high appreciation in which this lamp was held, in respect to the efficiency and economy of its operation; stating, as they do, that the Manlite lamp would never have been removed from the three mines under consideration had it not been for the unavoidable and unfortunate condition set up by the European War, which made it impossible for us to procure certain spare parts from the manufacturers in Germany, and which the rules of the Federal Bureau of Mines made it impossible to manufacture in this country at the present time.

Keystone Coal and Coke Co.,
General Offices, Huff Building,
Greensburg, Penn., Apr. 27, 1916.

Mr. Otto Schaefer, President,
Mannesmann Light Co.

Dear Sir: This letter I desire to place in your hands as a means of indicating my sincere regret that adverse conditions brought about through the inability of your company to secure supplies for the Manlite lamps makes it imperative that we must replace your lamp with another, the supplies for which we are assured can be secured as needed.

Please understand that in replacing your lamp at our Crow's Nest and Keystone Shaft mine we are doing so for the one important reason that repair parts for same required in connection with its general upkeep cannot be secured by you due to the present European war situation.

The lamp when in good serviceable condition gives a better light in the mine than any other lamp that up to the present time has been placed on the market, and I hope you will realize that I am making this change, not for the purpose of installing a better light, but rather to secure one upon which we can depend for daily service through being able to secure at all times necessary repairs.

H. F. BOVARD,
General Superintendent.

Keystone Coal and Coke Co.,
Keystone Shaft Mine,
Darragh, Penn., May 5, 1916.

Mr. Otto Schaefer, President,
Mannesmann Light Co.

Dear Sir: In acknowledging the receipt of your letter of the 2nd inst. relative to lamp-shift statement for month of April inclosed therewith, I am more than glad to embrace the opportunity given me to say that no matter how regrettable the matter of the removal of your lamps from this mine may be, it is at the same time more than a pleasure to say a word in their behalf and concerning their worth had all things been equal.

With reference to the lamp's light-giving properties, it goes without saying among men having the electric lamp proposition under consideration that the Manlite is superior—without question—to any other lamp exploited to date, and in this of course I readily concur. Had the war now possessing Europe not hampered your facilities for supplying the necessary repair parts from time to time, there would have been no occasion for any inefficiency in connection with the lamp's sound qualifications in general, and thus no reason nor desire for the installation of another type of lamp as a part of the necessary equipment of this mine.

I thank you for your most kind offer placing your electric-lamp knowledge and experience at my disposal, and most thoroughly reciprocate your hope that our pleasant relations in the past may endure for all time.

H. T. KNIGHT,
Superintendent.

Keystone Coal and Coke Co.,
Madison, Arona, Sewickley Mines,
Darragh, Penn., July 7, 1916.

Mr. O. Schaefer, President,
Mannesmann Light Co.

Dear Sir: Having just taken your electric-lamp installation from our Sewickley lamphouse, I wish to say that during the first several months that we used your electric lamps they certainly were appreciated, giving excellent service. However, as they were used longer and it seemed impossible to get the necessary spare parts as needed, which conditions of course we understand were beyond your control, we had to take your installation out.

In conclusion, I want to say that owing to the superiority of the light of this lamp, we were sorry that they could not have been kept in service, and could the necessary repair parts have been available I am sure, from the service we received the first few months, that your lamps would still have been in use at our Sewickley lamphouse.

CHARLES DAILY,
Superintendent.

Keystone Coal and Coke Co.,
Crow's Nest Mine,
Greensburg, Penn., May 19, 1916.

Mr. Otto Schaefer, President,
Mannesmann Light Co.

Dear Sir: Replying to your letter of the 1st inst., the Mannesmann electric cap lamp "Manlite" was in use at Crow's Nest mine for over one year. We installed them because they give a better light than any other lamp on the market. The service was satisfactory until the European War made it almost impossible to secure spare parts to keep up the lamps. This, together with lack of attention on the part of your employees, caused the batteries to leak to such an extent that our men protested so strongly against using them that we were compelled to discontinue the service on the first of this month.

W. E. HENDERSON,
Superintendent.

These letters need no comment. What the miner using an electric cap lamp considers first is the strength and permanency of the light, and in this it may be said without hesitation, the Manlite lamp excels any other electric lamp on the market. The light test of the Federal Bureau of Mines proved that this lamp, using a lens frosted on both sides, has a candlepower of 3.65 in the center of the lighted area, the illumination diminishing gradually throughout the area, which was without a shadow.

It is interesting to know, further, that at the time these letters were written, 200 Edison lamps had been in use at the Salem mine of the Keystone Co. for a period of six months, so that their relative merits and qualities were fully known to the company. I submit these letters and this information confident that you will do everything necessary to correct an impression that would be unfair and unjust in respect to the attitude of our custom toward the Manlite lamp, as having a battery inferior to that of any other lamp on the market. Let me repeat what was stated in an article fully describing the Manlite lamp, *Coal Age*, Vol. 8, p. 218; that the battery of that lamp is held in a rigid nickel-steel container. In this respect it is not inferior to the steel container of the Edison lamp, which is mentioned in the article, July 1, as a particular feature made possible by the use of an alkaline battery.

OTTO SCHAEFER, President,
Mannesmann Light Co. of America.

Tompkinsville, N. Y.

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Arbitrary Ruling

Letter No. 1—The reading of the foreword in *Coal Age*, July 15, p. 97, entitled "Arbitrary Ruling," calls to mind an occurrence that happened in a mine where I worked as a miner about five years ago. As the incident illustrates well the unwisdom of many mine superintendents and foremen in rejecting arbitrarily suggestions coming from one of the men in their employ, regardless of their merit, I thought it would be interesting in this connection.

While waiting in the office of a mine foreman one day, I overheard a conversation that led me to conclude that the superintendent was not working in harmony with his foreman and, although he did not realize the result, his arbitrary treatment of the foreman's question materially increased the cost of operation in the mine. Like many other superintendents, this man was jealous of his own capability in respect to managing matters in his charge and was wont to regard as an intrusion any suggestion coming from one of his inferiors.

The mine foreman had asked the simple question, "What is the cost of 8-ft. timber a foot, Mr. —?" The superintendent replied quickly, "Now, Jim, you never mind about the cost of timber or any other supplies sent in to you. You simply mind your own business and get all the work you can out of the men, and first, last and all the a—d time, get out the coal." On hearing this remark, I thought to myself, Well, Mr. Super, you are not as wise as you think you are. If you were you would give the man an intelligent answer to his question.

The same day this foreman came into my place and we had a little quiet chat, he being a good friend of mine. Before he went out I referred to the interview

in the office in the morning and asked him why he wanted to know the cost of the timber. He replied, "Well, you see, down in the Bennett vein they mined out the bottom bench of coal and of course used 8-ft. timber to hold up the top coal. Now, there is left in those places a lot of that timber that could be used in working the narrow veins, and I wanted to find out the cost of the timber so as to know whether there would be any economy in loading it up and sending it out for use in the small veins. Since he would not tell me what the timber cost, I cannot send it out, as it might be cheaper to leave it there to rot and buy new timber for the other place." Then, as he went out, the foreman added, "Believe me, I am done trying to be economical while working for that man. I know the price of nothing in here and cannot figure any way of saving money in the use of material, because the 'higherups' think it is none of my business."

I know from long acquaintance with this mine foreman that he is a deep student of the economical management of mines and could well fill the place held by his superintendent. It is easy to see that the superintendent failed radically in not making use of the peculiar abilities of the men in his employ. I have observed that the other foremen maintain the same attitude toward this arbitrary superintendent. They simply obey his orders and follow his instructions without asking any questions that would enable them to use their best judgment in directing the work in their charge. What a change would take place in these men should a real live wire be given charge of the mines as superintendent! There would be lively competition among the different foremen trying for record outputs and reducing costs.

Plymouth, Penn.

T. G. E.

Letter No. 2—There are in almost every mining district many illustrations similar to those given in the foreword entitled "Arbitrary Ruling," *Coal Age*, July 15, p. 97. One that I recall now is the following:

A certain coal company was contemplating installing a new haulage system in one of its mines and the mining engineer was drawing up a general plan for submission to the management. Working in this shaft was an intelligent miner who had had over 30 years' experience in different mines and had studied, for his own amusement, the haulage systems in operation where he had worked.

This man was naturally interested in the present proposition, which was to install a system of haulage that would enable the company to reach a large outlying area of coal, while at the same time handling the output of the present workings. After considerable study he arranged a plan that would require the use of but two locomotives, two side tracks or partings and two automatic trapdoors, which would eliminate the cost of trapper boys while greatly improving the ventilation of the mine.

After some hesitancy he presented the plan to the mine foreman, who took it to the mining engineer and superintendent. It received but little recognition from any of these men, however, as they disdained to give serious consideration to the plans of a common miner, and promptly dropped them into the waste basket. The mine foreman said emphatically that they could not consider a plan coming from a "coal digger."

The plan eventually evolved by the mining engineer and adopted by the company required two more entries than that submitted by the miner and necessitated a longer haul, employed three locomotives with their crews, three partings and five trapdoors, only one of which was automatic, the other four being attended by trapper boys.

Had the superintendent and mining engineer had less pride and been less confident of their own ability, they would have seen the advantages of the plan submitted to them by the miner and would probably have adopted any or all of its features with slight modifications. By its use, owing to the shorter haul, the output might almost have been doubled for the same cost of operation. B.

Slab Fork, W. Va.

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Detecting Gas by Smell

Letter No. 16—The many recent letters on this subject have doubtless proved of great interest to all coal-mining men who have worked in gas. If it were possible to bring these men together from all parts of the mining world and put to them the question, Can you detect marsh gas by smell? I am sure the great majority would answer "Yes." Times without number miners have been heard to exclaim, "She stinks up there."

It is possible that one whose olfactory nerves are not as sensitive as those of the average person will still claim that marsh gas, as found in coal mines, cannot be detected by smell. However, I can produce scores of men who are able to detect this gas when present in the mine, without the aid of a lamp, depending solely on their sense of smell. I do not claim that they can detect minute quantities of the gas, but such a percentage as would give a cap on a lamp. I claim that not scores, but hundreds of miners and firebosses will vouch for this statement.

In traveling through the mine passageways where the air is slow and gas is likely to accumulate, the fireboss has learned to cultivate his sense of smell. He would frequently be unable to complete his rounds if he had to travel the same distance with his lamp continually over his head while he watched for the gas. Now, I do not want to be understood as contradicting the statement that pure marsh gas is odorless. I only claim that whenever or wherever I encounter sufficient gas to give a cap on the lamp I can detect its odor at once, although I willingly admit that the odor may be due to the presence of some other gas that is always to be found in such a mixture.

Some men claim that the smell of firedamp is different in different mines, but my experience is that the gas has the same smell in all mines where I have worked in different parts of the globe. Where mixed lights are used in mines generating gas or where such a mine is worked with open lights, it is a common practice for the miner to set his light on the floor a short distance back from the face and proceed to test for gas by his sense of smell. I recall an instance where a miner persisted in entering a place after being warned by the men that "It stinks in there," and returned almost immediately minus some of his hair.

My experience on two occasions—one in Helensburg, N. S. W., Australia, and the other in No. 2 mine, Fernie, B. C., Canada—was similar to that of Mr. Greaves, described in *Coal Age*, May 6, p. 815. While sinking

the slope at No. 2 mine, Fernie, B. C., we always had difficulty in showing "all clear" in the upper V-shaped corner of the crosscut driven across the pitch to connect the slopes. In this particular place I found it nearly always impossible to get a cap and lower the lamp again without losing the flame. One deep breath in that place was sufficient to start a jumping sensation in my head and produce dizziness, and the inconvenience to miners when setting timber in those places can easily be imagined. The odor was exceptionally strong, and the miners never used their lamps to find the gas. Mr. Morgan states, *Coal Age*, June 3, p. 982, that he has "never heard of a man being overcome by breathing marsh gas." I want to say that I have been rendered unconscious twice in my life in that manner, and I believe this experience is so general that one is forced to the conclusion that if this effect is not due to the marsh gas but to some other gas such as hydrogen sulphide, the marsh gas must occur in mines more rarely than is generally believed.

When working a few years ago in a mine in California where the measures pitched about 60 deg., we encountered an explosive gas having a very strong smell that differed from the smell of marsh gas. When driving through the sand beneath the coal, water frequently percolated through the roof and was accompanied by gas. The gas seemed to come from the water and in my opinion was carried by it in solution. This gas had most of the characteristics of hydrogen sulphide (H_2S), except that the miners were most affected by it close to the roof. Since it was necessary to timber closely when driving these cross tunnels, the miners were compelled to work with their heads in the roof much of the time. The symptoms began with a smarting sensation in the eyes. Experienced miners quit work as soon as this occurred, and frequently two or three days had to be spent in a dark room applying ice or other cooling agents to relieve the intense pain.

F. G. J.

Carbonado, Wash.

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Waste of Material in Mines

Letter No. 6—I remember that J. W. Powell, in a recent letter on this subject, *Coal Age*, May 20, p. 896, showed very clearly that the condition of a workman's surroundings has a great deal to do with the way in which he performs his work and economizes material. Where everything around the mine is kept clean and orderly, the effect on the workmen is readily seen.

This fact was forcibly impressed upon me several years ago while I was performing the engineering work in several mines in the New River district of West Virginia. When taking the annual inventory in these mines, it was my duty to measure up all material in and around the mines. We measured the length of track in the mines and hunted up all the material that could be found in abandoned places and elsewhere.

To prove the terrible waste of material that frequently occurs in the operation of coal mines, I will cite an instance showing the condition in this respect in two of our mines that had been working for a number of years and which contained large areas of old workings that had been abandoned. In one of these mines I found several miles of track in place that had not been used for many years, and much of it would never be used again, inasmuch as

it lay behind very large falls of roof in a portion of the mine that had been practically worked out. I found much track under water in abandoned places, where it was only possible to follow the iron by feeling along the rail with our feet. I remember on one occasion we were measuring the track in a place flooded with water, and I called to the helper to go ahead with the tape, but he called back, "I can't go any farther, the water is to the roof."

In the same mine I found several old steel cars behind large falls of roof that would cost several times the value of the cars to remove. Similar conditions prevailed throughout the entire abandoned area, and much valuable material was lost beyond recovery. In this mine the roads were bad and the roadbeds sloppy, as no pains were taken to drain them. In many places on the main haulage road the tops of the mine cars would rub the roof. Should a car jump the track at one of these places, it would be necessary to pull it over the ties to a point where the roof was higher, before it could be again placed on the track. We were always reluctant to go into this mine to do any work.

THE CONTRAST OF A WELL-KEPT MINE

There was a surprising contrast between the mine I have just described and the other one operated by the same company. On going to this second mine one was immediately impressed with the clean, orderly appearance both on top and underground. In this mine I found no tracks in any of the abandoned portions and we were able to account for all cars as being in working order or in the repair shop. I found little loose material scattered around, and although the mine made as much water as the other, there were few places where the tracks were excessively wet and muddy. The roads were well drained wherever this was possible and the water was kept pumped out of the mine. I need not say that it was a pleasure to work in this mine, and we could always accomplish more in less time than in the one first mentioned. H. L. HANDLEY.

Ruth, Nev.

The Efficient Fireboss

Letter No. 23—I have been greatly interested in the different letters on "The Efficient Fireboss," especially those of "Old Fireboss," *Coal Age*, Apr. 29, p. 768, and Edward H. Coxe, May 20, p. 895.

Mr. Coxe's reply, or rather attempt to reply, to "Old Fireboss" reminds me of a story once told by a friend about a blacksmith and an onlooker. The former was doing a piece of work, and the onlooker repeatedly interrupted him by suggestions as to how it should be done. Finally, the blacksmith became annoyed by the frequent interruptions and asked the onlooker, "Are you a blacksmith?" who replied, "No." "Well," said the blacksmith, "you don't know a d—d thing about it," and went on with his work.

To my mind this little story illustrates the relation of Mr. Coxe and "Old Fireboss." I do not believe that Mr. Coxe knows a thing about it; at least he does not speak from an experienced standpoint.

If there is an official about a mine who is more imposed upon and whose work is less appreciated than a fireboss, I have yet to meet him. All experienced firebosses can readily appreciate "Old Fireboss'" remarks on the difficulties encountered in the work. As a rule,

that official is regarded with suspicion, not only by the mine foreman, who believes that he is blocking off places as containing gas or other dangers simply to reduce the tonnage, but also by the miners, who are sore because they cannot get to work immediately. Some superintendents and foremen are always afraid the fireboss will not have enough to keep him busy.

No one who is familiar with firebossing will be willing to say that the wages paid that official compensate him for leaving his family shortly after midnight and often when he does not feel able to go underground, but goes as usual, because it is too late to get word to the foreman. Nor will anyone be willing to say that the fireboss' pay, which is often less than that of roadmen, timbermen and other shift hands, compensates him for taking the pumper's place when he is off on a drunk, or the place of an absent motorman or boss driver, after having completed his examination of from 60 to 120 working places. Usually, if the fireboss is off duty, he is docked for that time.

I want to say, give the fireboss a square chance; pay him a monthly salary in the same way a mine foreman or other official is paid. Don't give him a larger section than he can properly examine in the time allotted for that work, and don't impose other work on him when he should be looking after the ventilation on the falls and in abandoned parts of the mine or traveling air-courses to see that they are clear and properly timbered. Give him full authority in respect to his work, and do not fail to credit him for what he does. The result will be more efficient firebosses, safer mines and fewer explosions and other accidents. R. H. K.

Meadowbrook, W. Va.

The Miner and Safety First

Letter No. 18—In order to obtain the greatest benefit from the safety-first idea, I think that mine officials should make and apply some of these rules to themselves.

In reading an account in *Coal Age* of an explosion that occurred not long ago, I learned that matches were found on some of the men who were killed. Again, we know that many fatal accidents occur from the use of black powder. I would ask, Why is it that the officials of gaseous mines will permit men to go into the mines in the morning without first being examined to see that they have no matches about them? When matches are found on a person a suitable punishment or fine should be imposed, so that men will be more careful not to take matches to the mine.

Also, Why do mine officials continue the use of black powder, when permissible powders give better results and their use reduces the number of accidents from blasting? Not having been in this country very long, it may be that I do not understand the conditions that make it necessary to use black powder in some mines. In the 18 years that I mined coal in France, I used only permissible powders. I never saw black powder in those mines, although dynamite was used at times when open lights were employed. But now, safety lamps are in use throughout the mines and all blasting is done with permissible powders.

Many miners have little regard for safety. I remember at one mine where I worked the manager gave little attention to what was being done underground. Safety lamps were used in the advance workings, while open lights were allowed in other parts of the mine. Not a few of

the miners would tamper with their lamps, and the bonnet was often unscrewed and set aside, as the lamp then gave a better light. This practice left the gauze unprotected and liable to be injured by a blow from the pick.

In the same mine when lights were extinguished by accident, the miners would open the lamps and relight them with matches that they usually carried into the mine. They would do this, notwithstanding the company furnished a boy to carry lighted lamps into the mine to exchange for any that might be extinguished by the miners. Rather than wait a short time for the boy to bring a light, the miner would run the risk of relighting the lamp himself. Many lamps were so badly injured by being tampered with in this way that they were useless.

Peru, Ill.

GASTON LIBIEZ.

Letter No. 19—Some 20 or 30 years ago greater care was taken by the miners to avoid accidents, but today the work of the miner is performed under such high pressure that he neglects to take the simplest precautions for his own safety. In those days the miner used his pick, but today the average miner regards powder as cheaper than muscle.

It may be said, also, that the mine operator partakes largely of the same spirit of disregard for safety. Everything is done to increase the capacity of the mine and reduce the cost of operation, and still the cry is for more and cheaper coal, while the miner demands a shorter working day. The average miner wants to load his full turn, and in order to do this he will take a chance and continue to load his cars under a loose piece of slate that requires the setting of a post to make it safe. The mine inspector is well aware of this habit of the miner and will often stay in a working place until the needed posts are set.

No argument is needed to prove that "safety first" must commence with the mine officials, or the rules for safety cannot be enforced in the mine. There is, today, too much laxity on the part of mine superintendents, foremen and assistant foremen in respect to enforcing the rules and regulations relating to safety. Mine officials should be given police power and held responsible for safe conditions in their mines. In this regard, we may well take a lesson from Great Britain, France and Germany.

There are two chief reasons for the safety-first movement in coal mining—a financial reason based on the fact that mine accidents are costly affairs, and the humanitarian reason that a strong, healthy and contented miner will do more and better work in the mine. These two reasons have led to the passage in many states of miners' compensation laws, and many operators have found it to advantage to employ their own private mine inspectors, whose duties are to see that the rules for safety are obeyed and do everything in their power to reduce the accident rate in the mine. It is gratifying to know that officials and miners are getting more of the coöperative spirit every day.

A few instances in my experience while mine inspector will serve to show the spirit of recklessness that is common to the miner: On one occasion I compelled a miner who was working under a bad piece of slate to stop his work at once and take it down. Before doing so, he wanted to know what business it was of mine if he should get hurt through his own carelessness or recklessness, adding, "I would have to suffer the pain and not you." Were it not for its seriousness, the argument would be comical.

In another mine I found a man working under a half-inch scale of loose top. Except in a few cases this would come down with the clod. When it did not the miners would often leave it up and work under it for days at a time until it finally dropped. They did this because the piece was not easily wedged down, as it would break off in small pieces. Replying to my order to take the piece down, the miner said he had been working in that mine for 16 years and knew well the character of the roof. He added that he was not going to take the piece down for me or anybody else. But when he found that it was a choice of taking down the piece or going home, he went reluctantly for his pick, at the same time uttering certain complimentary (?) remarks about persons coming into his place and instructing him as to what was safe in a mine where he had worked so long. The piece of slate was so loose that it fell heavily the moment the miner inserted his pick above it. The piece was 5x10 ft. in area and 1½ in. thick; it fell from a height of 7 ft. and might easily have crippled the man for life.

Another miner working in a breast of 8-ft. coal had nearly finished loading his car under some overhanging top coal that was about ready to fall. He needed only a bushel more of coal to finish his car, but all the loose coal in the place was under the overhanging top and he actually asked my permission to finish loading his car with that coal before taking down the loose top coal. The man was willing to risk his life for a few shovelfuls of coal.

THE MINERS' UNION AND SAFETY FIRST

A peculiar incident that shows the influence exerted by the Miners' Union and its effect on the safe operation of mines occurred in my district, though not coming under my personal observation. A mine manager had refused to permit two shotfirers to go into the mine, because they had stopped at a saloon on their way to work and, in the opinion of the manager, were not in a condition to perform the work safely and efficiently. Sending them home, he had two other men fire the shots for that day. The shotfirers sent home appealed to the union officials, who decided that the company must pay them for that day's work. Although any mine inspector or any court would have supported the mine manager in his judgment of the condition of these men, the company paid the men for the work that they did not do, in order to avoid trouble.

In closing, I am glad to say that the old spirit of opposition to the safety movement, that in some instances caused local strikes, is fast disappearing and miners generally are taking a whole-hearted interest in all safety measures and first-aid work, even lending their support to hospitals and other efforts put forth by the operators in their behalf. I have even seen some miners, having obtained a first-aid certificate, keep a first-aid outfit in their toolbox ready for instant use in case of need.

At some mines the company pays a committee of the miners to make periodical inspections of the mine and offer any suggestion or criticism they may desire in respect to safety measures. The example of the United States Steel Co., at its mines in West Virginia, should spur us to greater efforts. I think it would be a good plan if its reports showing the reduction in the accident rate could be sent to every mine in the United States and posted where it could be read by the miners.

W. L. MORGAN,

East St. Louis, Ill.

Former State Mine Inspector.

Inquiries of General Interest

Use of Twin Mine Fans

We have been troubled lately by an insufficiency of air at the working face in our mine. As the airways are all cleaned up and the stoppings on the main roads in good condition, we were satisfied that the trouble was due to a lack of power on the air. To overcome that difficulty we were advised to install another fan of the same size as the one already in use and were told that it would be necessary to have the new fan built of the same dimensions and run at the same speed in order to produce a perfect balance and give good results.

The second fan was therefore ordered to be made of equal dimensions with the first, which was 10 ft. in diameter and 30 in. wide, the blades being 30 in. deep and radial. This new fan was installed at the top of the upcast shaft, with the intention of running it as an exhaust fan, the old one being operated as a blower. The two fans gave no improvement in the volume of air circulated in the mine.

I thought that *Coal Age* could explain the reason for this failure and advise me as to what is the best course to pursue. Naturally, I want to use the two fans now that we have them, but would like to ask if it would have been better to have ordered one large fan to replace the 10-ft. fan in use. I would like to ask, also, if it is possible to operate two fans of different diameters on the same circulation, by any arrangement whatever.

—, Kan.

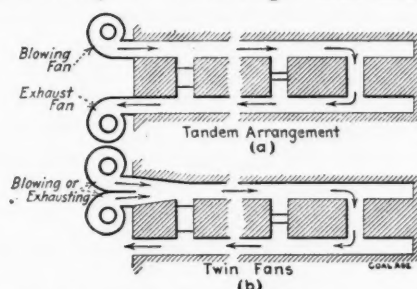
MINE SUPERINTENDENT.

The airways and stoppings in this mine being in good condition, the conclusion that the insufficiency of air was owing to a lack of power producing the circulation is correct. There are, of course, two ways of enlarging the ventilating power in a mine, aside from increasing the speed of the fan already in use. Assuming then that the speed of the fan cannot be increased with safety, either a fan of greater dimensions must be installed in place of the one in operation, or a second fan must be set up and operated in conjunction with the first. The two fans may or may not have the same dimensions.

It is a mistake, however, to attempt to operate two fans in series, or as we say, to run the fans "tandem" by placing one at the upcast shaft to act as an exhaust to assist the circulation already produced by a blower working on the downcast shaft. The tandem arrangement of centrifugal fans has been tried in numerous instances and proved a failure. The reason for this is that the air current set in motion by the blower enters the exhaust fan with a velocity due to the action of the blower, and before the exhaust fan can increase this velocity, it must be run at a speed that would create a greater current velocity than when operated alone. It is easy to see that, in the tandem arrangement, one or the other of the two fans will have the supremacy and there will result a great lack of efficiency. Indeed, the operation in series of two fans of the same dimensions and at the same speed will render one of them practically useless.

In the accompanying figure are shown the two arrangements. In the tandem method shown at *a*, two fans of the same dimensions are operated in series, the one acting as a blower on the intake and the other as an exhaust on the return opening of the mine. As previously stated, this arrangement is wrong and will always result in a great loss of efficiency or prove a total failure.

In the same figure, at *b*, the two fans are shown in operation as twin fans working on the same end of the air, either blowing or exhausting. The arrows, in the



RIGHT AND WRONG ARRANGEMENT OF TWO FANS

figure, indicate the blowing system of ventilation. The fans will work equally well, however, when exhausting the air from the mine, except for a slight difference in efficiency, owing to a difference in the density of the air within the ventilators. In the parallel arrangement shown at *b*, the fans may be mounted side by side on the same shaft, although in that case it is advisable that they be placed a sufficient distance apart to enable each to have a free double intake. Or, if desired, the two wheels can be mounted close together on one shaft, with or without a partition between them. In the latter case their action is practically that of a single fan of double the width and having a double intake.

Thus far we have considered the two fans to have the same dimensions and to be operated at equal speed. It is possible, however, to operate two centrifugal fans in parallel and working on the same air current when the dimensions of the fan (diameter and width) are quite different. The successful operation of the fans in such cases requires the careful proportionment of area in the fan drift. Also, it is necessary to regulate the speed of each fan so as to give an equal peripheral speed. In other words, the speed of rotation must vary inversely as the diameter of the fan. Also, the sectional area of the fan drift leading to each fan must be correctly proportioned to the quantity of air each will deliver against the same water gage or unit pressure.

The operation of twin fans at the same speed will require twice the power necessary to drive a single fan at that speed, and the volume of air will be increased in the ratio of $\sqrt{2} = 1.26$. That is to say, if a fan of given dimensions will give 10,000 cu.ft. of air per minute at a fixed speed against a certain water gage, twin fans of the same dimensions and operated at the same speed will give 12,600 cu.ft. per min. against the same water gage.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—A quantity of air equal to 100,000 cu.ft. per min. passes through two airways of equal section and of such unequal length that the resistances are to each other as 5 to 1. What quantity is passing through each airway?

Ans.—This question does not admit of a definite answer, for the reason that the resistance of an airway depends on both the length and the velocity of the air-current or in this case the quantity of air passing, as the two airways have the same section. Thus the resistance in one of these airways can be made five times that in the other by making the length of the one five times the length of the other, with the same velocity of air-current or quantity passing, or both the length and quantity of air passing may vary with the same result. This is more clearly shown as follows:

The expression for the resistance of an airway is

$$R = pa = klov^2$$

But since the airways here have equal section, the value of the area a is the same in each, and the resistance R is equal to the unit pressure p in each airway. Hence if the resistance of one airway is five times that of the other, the unit pressure of that airway is also five times that in the other. The formula for the unit pressure of an airway is

$$p = \frac{kloq^2}{a^3}$$

But since, k , o and a are all the same in each airway and the unit pressure p is five times as great in one airway as in the other, the value of lv^2 for that airway is five times that value in the other airway. It is clear, therefore, that the resistance of one airway can be made five times that in the other airway by making the length of the one five times that of the other, while the velocity or quantity of air passing is the same in each. Or, making the length ratio less than 5, the quantity ratio will be increased accordingly. Hence no definite answer can be given to this question without knowing the ratio of the lengths of the airways.

Ques.—While the fan is running at the same speed, will a larger quantity of air pass through an airway 8x10 ft. in section than through one 6x8 ft. in section? Explain why.

Ans.—For the same speed of fan it may be assumed that the power on the air is practically the same in each of these airways. In that case, assuming the airways are of equal length, the quantity of air in circulation varies directly as the area of the airway and inversely as the cube root of the perimeter. The value for each of these airways is as follows:

$$\text{Airway, } 8 \times 10 \text{ ft., } a/\sqrt[3]{o} = 80/\sqrt[3]{36} = 24.2$$

$$\text{Airway, } 6 \times 8 \text{ ft., } a/\sqrt[3]{o} = 48/\sqrt[3]{28} = 15.8$$

Hence, since $24.2 \div 15.8 = 1.53$, the larger airway will pass practically 1.5 times as much air as the smaller one, for the same speed of fan.

Ques.—Find the gradient of a mine road, such that the resistance to hauling will be the same for the loaded and empty trips. The weight of the loaded cars is 1,800 lb. each, while that of the empties is 450 lb. each. Assume the track resistance to be $1/70$ of the weight of the load hauled.

Ans.—In order that the resistance to hauling shall be the same for loads and empties, the grade must favor the loaded cars and be such that the friction pull less the gravity pull of the loads shall be equal to the friction pull plus the gravity pull of the empties, because the friction pull resists the movement of both loads and empties, while the gravity pull assists the movement of the loads but opposes the movement of the empties.

Calling the weight of the loaded cars W , that of the empty cars w , the grade angle of the road a , and the coefficient of friction being $1/70$ of the weight in each case, remembering that the gravity pull is always equal to the weight hauled multiplied by the sine of the grade angle, we have for equal resistance of loads and empties

$$W(1/70 - \sin a) = w(1/70 + \sin a).$$

But this equation may be written

$$\sin a(W + w) = 1/70(W - w)$$

Hence

$$\sin a = \frac{1}{70} \left(\frac{W - w}{W + w} \right) = \frac{1}{70} \left(\frac{1,800 - 450}{1,800 + 450} \right) = 0.00857$$

The corresponding grade angle is 0 deg. 29 min. 30 sec., or the road should have a grade of practically 0.85 per cent., which is a rise of $10\frac{1}{4}$ in. in 100 ft.

Ques.—A shaft has been sunk to a depth of 140 yd. at a point 420 yd. from the outcrop of a coal seam, which dips toward the shaft at an angle of 41 deg. 15 min. Find the length of a cross-tunnel driven from the bottom of the shaft to strike the seam.

Ans.—Assuming a level surface, the length of the cross-tunnel from the bottom of the shaft to the seam is $420 - (140/\tan 41^\circ 15') = 420 - (140/0.877) = 297.2$ ft.

Ques.—If, in your examination for gas, you detected a cap $2\frac{5}{8}$ in. high, what percentage of gas would you say was indicated by this cap?

Ans.—When using an unbonneted Davy lamp burning sperm or cottonseed oil, the percentage (J) of gas present in the mine air, corresponding to a height (h) of flame cap can be calculated by the formula $J = \sqrt[3]{36h}$. For a $2\frac{5}{8}$ in. flame cap, the percentage of gas is

$$J = \sqrt[3]{36 \times 2.625} = 4.55 \text{ per cent.}$$

Ques.— A , B and C are three points along a gangway whose elevations are respectively, as follows: A , 990.1 ft.; B , 996.6 ft.; C , 1,000.1 ft. How many feet is C higher than A , and what grade will be obtained from A to C if the distance is 1,000 ft.?

Ans.—The point C is $1,000.1 - 990.1 = 10$ ft. higher than point A . The road from A to C will therefore rise 10 ft. in 1,000 ft. of distance, and will have a grade of 1 per cent., the rise being 1 ft. per 100 ft.

Coal and Coke News

Washington, D. C.

Secretary of the Interior Lane recently announced the location of two of the three mining experiment stations and the three mine-safety stations provided for in the act passed last year by Congress and appropriated for at the present session. The first of the experiment stations is to be at Fairbanks, Alaska; the second at Tucson, Ariz., and the third, not yet definitely announced, in the Pacific Northwest.

The exact location of the last-named station is being held in abeyance pending personal investigation of the needs of that section soon to be made by Director Van H. Manning of the Bureau of Mines at the request of Secretary Lane. The safety stations as decided upon will be at Butte, Mont.; Reno, Nev., and Raton, N.M. The sum of \$25,000 is appropriated for each of the mining experiment stations and \$101,500 for the three safety stations.

The act authorizes the Secretary of the Interior to establish in the several important mining regions of the United States 10 mining experiment stations and 7 mine-safety stations in addition to those already established, but provides that not more than three of the experiment stations and the same number of safety stations shall be established in one year. The purpose of all the stations according to the law is to make investigations with a view to improving conditions in the mining, quarrying, metallurgical and other mineral industries, safeguarding life among employees, preventing unnecessary waste of resources, and otherwise contributing to the advancement of these industries.

Each of the mine-safety stations is to be equipped with an all-steel mine rescue car which will respond to disaster calls within its prescribed territory. Congress has appropriated \$53,000 for the purchase of three cars and the contracts are about to be let by the Bureau of Mines. These cars will be of special design and will represent the most modern thought in rescue work. They will be manned by expert crews of life savers, who, when they are not employed at a mine disaster, will go to the different mining camps and train the miners in rescue work and first aid to the injured.

"The establishment of the metallurgical experiment stations and the safety stations is one of the most important constructive steps that has been taken by Congress in the upbuilding of our mineral industry," said Secretary Lane in commenting upon the announcement of the location of the stations. "It is a most deserved recognition of an industry which now has a yearly output of probably two and a half billion dollars and which is next to agriculture in its importance to the welfare of the country."

The experiment stations come to the great West at a time when they are peculiarly needed. The great impetus which has been given the industry through the European war and the coincident development of the so-called oil flotation process in the utilization of the lower grade ores have emphasized the necessity for such research aid as only the Federal Government can give. With the development of metallurgical processes, many of which are now under way, I expect in the near future to see a much greater industry, enjoying greater prosperity and employing more men, with the utilization of the low-grade mineral deposits to their highest extent. Already there are signs that this is coming. Old mines are being reclaimed, abandoned dumps which contained supposed worthless material are being worked over, and many prospects that heretofore were not considered workable are being turned into substantial mines.

And with the three mine-safety stations, we are not forgetting the men who toil beneath the ground. Their safety is an important part of the work of the Bureau of Mines.

There has been a great deal of earnest rivalry between different localities for these experiment and safety stations and it has been difficult to make the selections. I can only say that the matter has been given much careful thought in all its bearings and that we have done what we thought was for the best. In the future some of the other localities will be given their opportunity.

A Complaint About Rates

A complaint against the rates on bituminous coal from mines in Kentucky and Tennessee to Toledo and Sandusky, Ohio, when intended for shipment beyond by vessel, has been filed with the Interstate Commerce Commission by the Federal Coal Co. and others. The Louisville & Nashville and other railroads were named defendants. This complaint is likely to comprise a new and important feature of the general lake cargo rate investigation which the Commission recently announced it would undertake.

In the new complaint the Commission was requested to order the roads to establish joint proportional lake cargo rates to the ports of Toledo and Sandusky on bituminous coal from the mines of the complainants when destined beyond the lake ports for shipment by vessel to destinations in Illinois, Michigan, Wisconsin, Minnesota and other states. It was pointed out that such proportional rates should be lower than the present local rates which are charged to the lake ports. Furthermore it was declared that the roads apply proportional rates on lake cargo coal from mines in the coal fields of Ohio, Pennsylvania, West Virginia and Virginia, which are in competition with the coal from the mines of the complainants.

Rates To Be Advanced Five Cents

Advances in the rates on bituminous coal in carloads from mines in Illinois and Indiana to points in Illinois, Indiana, Wisconsin and Michigan will take effect on Sept. 1 next according to a decision just issued by the Interstate Commerce Commission. The railroads have proposed an advance of 5c. per net ton in the rates on the interstate transportation of this coal to all points in Illinois except to certain points on the east bank of the Mississippi River, to points in Indiana and points in the southern peninsula of Michigan and in Wisconsin south of the line of the Chicago, Milwaukee & St. Paul R.R. from Milwaukee to Madison and east of the line of the Illinois Central R.R. running south from Madison. Similar intrastate rates in Illinois and Indiana were produced but these are under suspension by orders of the state authorities. The Commission held that the roads have justified the advance in the interstate rates.

The coal operators objected to the advances chiefly, it was said, because of the alleged discrimination which will result from this increase without any increase in rates on coal from the east. It was maintained that by reason of the production of coal south, east and west of them their market is practically restricted to their own states and points farther north. They contended that their coal competes keenly in this territory with coal from the East, which is of a higher grade than that produced in Illinois and Indiana.

The decision of the Commission, however, stated that little Eastern coal is used in this territory for steam purposes, the demand being supplied by the slack and screenings produced by the coal operated involved in the present case. Eastern coal is used in considerable quantity in this territory in the production of gas and coke and in the manufacture of malleable iron, etc., for which purpose it is better adapted than the Indiana and Illinois coal, and therefore more valuable. Both Eastern coals and Illinois-Indiana coals are used for domestic heating purposes.

HARRISBURG, PENN.

Holding that it was the purpose of the Legislature to strike down an intolerable practice and that the beneficial purposes of the law should not be thwarted by a restricted construction of its language, Judge Kophart of the Superior Court, in his opinion, received on July 28, reversed the decision of the Luzerne County Court (Judge Strauss), quashing the indictment against Richard Jones, a mine foreman, and directs that the mine foreman be placed on trial.

Mr. Jones was an assistant mine foreman for the Lehigh Valley Coal Co. and was charged with accepting money from a miner in his employ. The Judge of the lower court held that the mine foreman was not an employer in the strict construction of the language.

Judge Kophart reviews the case at length and says in part:

The words "his or theirs" in the act (June 15, 1897) are used in a descriptive sense. The foreman and superintendent is referred to in his representative capacity, having under the laws of this state the right or power to employ, control and discharge, and when the words "his or their" are used as to the employees, it describes the relation between them and the foreman, the persons who are affected by this act, as being under his or their immediate control and supervision, and for this purpose they are his or their employees. It is moreover a colloquial expression of employees, much in common use, that those who work for a foreman express their employment as working for Richard Jones (the foreman) rather than the owner, operator or master.

The beneficial purpose of the act should not be thwarted by a restricted construction of its language. It was the purpose of the legislature to strike down an intolerable practice, enforced by unscrupulous persons desiring to profit at the expense of those dependent on their grace for daily wages.

A fair interpretation of the Act of Assembly accomplishes this purpose.

Workings of the Compensation Act

In a report of the working of the Compensation Act, by Dr. F. M. Bohlen, legal adviser to the compensation board, it is stated that out of 950 fatal accidents and about 100,000 non-fatal accidents for the first five months of the year there have been only about 13,000 settlements under the law. Dr. Bohlen explains that in many cases private settlements have been reached, in other cases reports of accidents were grossly exaggerated, and in many cases it has been difficult to secure reliable data. This is particularly true of foreigners, who hesitate to sign papers.

He suggests some changes in the law. One of them is that the taking out of insurance be made compulsory where employers are not permitted to carry their own insurance funds. The majority of those who do not insure themselves are small employers, and it sometimes happens that their assets are so meager that in case of serious accident to one or more employees there is difficulty in forcing collection of the regulation benefits.

Dr. Bohlen also suggests an amendment to the effect that discrimination in the hiring of men, because of their age or the size of their families be prohibited. Just how this would be accomplished was not made clear. A recommendation of this kind certainly runs contrary to the Constitution, as an employer has the privilege of hiring whom he pleases and if he chooses to hire only men below a certain age limit or single men, or men with small families, it's nobody's business but his own.

No doubt some provision should be made for employees likely to be discriminated against in so far as that is possible. It might be suggested that an employer would receive concessions in insurance rates from the state for old men that are more liable to accident and for men with physical defects. The state could guard against this in making rates.

PENNSYLVANIA

Anthracite

Jeddo—The fire in the Ebervale mine of the G. B. Markle Co. was extinguished on July 29, after raging for 12 hr., at one time threatening serious damage.

Summit Hill—The Owl Creek Coal Co., which has been prospecting for anthracite coal for a number of years without success has suspended operations for the present. The work is being done near the site where coal was first discovered in 1791.

Mahanoy City—The production of coal throughout this section of the anthracite region has been seriously hampered by the excessive rainfall during the month of July. During one day recently 2.3 in. of rain fell, bringing the total up to 13.19 in. for the month, a record which has not been approached in 33 years.

The Lawrence colliery, which has been idle for quite a number of weeks undergoing repairs, has resumed operation giving employment to 500 men and boys.

Lansford—The Lehigh Coal and Navigation Co. is about to tap the largest and richest vein of anthracite coal between this city and Nesquehoning. Trees already have been removed and work commenced on a stripping operation, which probably will last for years. An area about 6 mi. long and fully a mile wide, is underlaid with a bed of coal, at some places said to be about 100 ft. thick. At places it runs near the surface. Near Nesquehoning the company drove a tunnel into the mountain, and after penetrating less than 50 ft. struck a rich bed of coal. The drainage tunnel running between Little Italy and the Lehigh River will do away with all pumping and will drain the new operation. The company also has constructed a railroad over which the necessary supplies will be conveyed. It is estimated that the coal deposit between here and Nesquehoning will last for at least 100 yr.

Pittston—The Lehigh Valley Coal Co. has filed an appeal from the value of its property as fixed by the city assessors. The coal company charges that the assessment for 1916 is excessive and exorbitant, in excess of the price the property would sell for at public sale, higher than surface property and that the assessment was illegally made by the blanket method of \$250 a foot-acre.

Hazleton—The Beaver Meadow, Coleraine, Jeansville and Beaver Brook mines were flooded and others badly hampered by the heavy rainstorms on July 26. The trolley station of the Lehigh Traction Co. at Tresckow was engulfed in a mine cave caused by washouts and the weak conditions of the workings underneath. Most of the big strippings in the Lehigh field were submerged for several days. At some places the water reached the fireboxes of the steam shovels. One

miner lost his life in a rush of water in the No. 11 colliery of the Lehigh Coal and Navigation Co. Three men were caught in the flood in the lower level, but rescuers succeeded in getting two of them out alive. The third man was dead when brought to the surface.

Pottstown—After a period of idleness covering 12 years, the Gabel mine is being placed in readiness for operation. As soon as the power plant is in shape to operate, the pumps will be started and the mine unwatered.

Bituminous

Washington—Final details are being worked out between the Pittsburgh Coal Co. and the Pittsburgh Westmoreland Coal Co., for the transfer of the latter's holdings. It is believed that final arrangements will be made shortly. Four or five new mines will also be opened by the Kuhn interests in the upper Pigeon Creek or Ten Mile Creek Valley.

Uniontown—Approximately two million dollars in wages to coal and coke workers in Fayette County was recently distributed. All of the companies do not pay upon the same day, but most of them pay within a few days of each other. With such vast amounts going into the hands of coal and coke workers, prosperity would appear to be an established fact.

Connellsville—Hot weather and a scarcity of labor recently reduced the coke production in the Connellsville region to about 404,000 tons per week. At times it was impossible to secure enough men to pull the ovens, and 450 were shut down. The demand for coke remains unchanged, in spite of the anticipated withdrawal from the Connellsville market of certain furnace interests which will be soon supplied with fuel from their own byproduct plants.

WEST VIRGINIA

Wellsburg—It was recently announced that considerable industrial development would commence at once in the Buffalo Valley between Wellsburg and the first tunnel on Bethany Pike. Fifty new houses for miners will be erected, and a coal mine will be developed at that point. It is thought that the railroad will be extended eventually to the Monongahela Valley, by which means a more direct route will be obtained.

It has been announced that Cyrus Ferguson, of Holliday's Cove and others, will take over the Rex Carbon Coal Co., at Cliftonville in Brooke County. It is understood that the new owners will make an opening through to Tits Run, northward. Thousands of dollars will be spent in this improvement, and by this means a thorough ventilation system will be established in the mine.

Wheeling—Walter W. Laughead and E. S. Higbee, acting for the Wheeling Center Coal Co., recently closed a deal with the Whitaker-Glessner Coal Co., whereby the latter acquired the title to 300 acres of coal land located in Ohio County. The purchase price is said to have been \$42,000, the coal being a portion of a block, a part of which was recently sold to a local steel company at an approximate price of \$60,000.

Fairmont—C. E. Minor was recently awarded a contract to build 50 houses at the Helen's Run mine, of the Consolidation Coal Co. This work will be started immediately, and will be pushed to completion as rapidly as possible.

Charleston—A decision was recently entered in the Common Pleas Court of Kanawha County by Judge H. B. Rummell to the effect that the Kanawha & Hocking Coal and Coke Co. secures possession of the coal mines and property in Fayette County, and the property in Kanawha County formerly under lease to the Sunday Creek Coal Co. This decision dissolved an injunction which had been in force for some time, preventing the Kanawha & Hocking Co., from interfering with the operation of the Sunday Creek Co. on the lands leased from the former concern.

Idamay—The Consolidation Coal Co. recently awarded the contract to Kisner Bros. for the erection of 50 dwellings at this point. The construction program calls for these houses to be completed by Christmas. A large store building will also be erected at Hutchinson, W. Va.

KENTUCKY

Hazard—The Kentucky River Power Co., with a power plant here, announces that it has signed 10-yr. contracts for central-station service with every coal operation in its field, one company alone excepted. This company is the Ashless Coal Corporation, which has a modern power plant of its own, installed a year or so ago.

OHIO

Columbus—The Ohio mine-rescue car, manned by several assistants in the Ohio mining department, started out recently

on a tour of instruction to teach miners and mine superintendents principles of first aid.

Columbus—Suit has been filed in the Federal Court here against the Sunday Creek Coal Co. by J. C. Underwood, asking damages of \$18,000 for alleged violation of contract. The suit sets forth that Underwood had a contract with the company providing for a royalty of 4c. a ton on coal mined on property which he had leased to the company, and that the mine was abandoned. Another suit against the company asks for \$10,000 damages as a result of the death of Andy Getzy, who, it is alleged, was suffocated by black damp while trying to rescue a child from an old shaft.

Glouster—A big celebration commemorating the reopening of mines in the Hocking Valley was held at Glouster last week, participated in by miners and operators alike. The affair was the first of its kind in the history of mining in the Hocking Valley.

Neffs—The Baltimore & Ohio Coal Co. has resumed operations at the Neff mine, this having been closed down on account of extensive improvements to the tipple.

Athens—Operators and union officials interested in the Hocking district have expressed the opinion that there will be no shut-down as a result of the decision of the Ohio Supreme Court temporarily restraining the Public Utilities Commission from placing in effect an order reducing freight rates on coal shipments. This belief is based upon the opinion that the Commission will be sustained when the court hears the case. Most of the mines in the Hocking field are now in operation, following their long lay-off, and about 9,000 men are employed. Other mines will be opened if the court decision is favorable.

ILLINOIS

Hillsboro—Abstracts are being prepared for closing the options recently obtained by Eastern capitalists on 5,000 acres of coal lands east and southeast of Hillsboro. The price to be paid is \$15 an acre, which means that about \$75,000 will be distributed. The deal was put through by George Huffer of Shelbyville and A. E. Neal, of Hillsboro. It is announced that steps toward developing the property will be taken without delay.

Springfield—The new Jones & Adams mine, 2 mi. east of Springfield, resumed operation Aug. 1. It had been closed down since April. The company expects to operate the mine regularly and to keep it going all winter. Preparations are being made for resumption of work at a number of other mines in the Springfield district.

Cairo—The project of building the Chicago, Springfield & Cairo R.R. through some of the most extensive coal fields of Illinois is being revived. W. R. Crumpton, of Chicago, and F. T. Keisacher, of Springfield, are promoting it. It is proposed to use gasoline-driven cars for passengers and steam for coal and other freight.

Staunton—The second annual convention of the State Co-operative Society was held here Monday at the Mine Workers' Labor Temple. Coöperative societies of the state were represented by delegates. The constitution and the uniform local branch bylaws were revised to conform to the needs of the organization as developed by the year's experience. Steps were taken toward making the organization a national coöperative society, and toward inaugurating a wholesale department.

Duquoin—Depositors of the defunct Henry Horn bank, which failed for \$350,000 when Horn, who was a prominent coal operator, died in December, 1914, are receiving a 10 per cent. dividend, amounting to \$30,000. A dividend of 20 per cent. was paid some time ago. It is expected that the depositors will receive at least 40 per cent. altogether.

Pana—Four miners were recently reported killed and two others severely injured as the result of a gas explosion in the Springside mine. The fan at the mine had been stopped over Sunday July 30 and when the men entered the operation a quantity of explosive gas was ignited.

Percy—Mine No. 6, owned and operated by the Willis Coal and Mining Co. of St. Louis was recently closed for an indefinite period. About 400 men are thus thrown out of employment.

COLORADO

Denver—The Federal investigation into coal trade conditions in the West was opened here recently before E. N. Hurley, chairman of the Federal Trade Commission. More than 50 prominent coal operators, representing the states of Washington, Montana, Wyoming, Utah, New Mexico and Colorado were in attendance.

PERSONALS

Hywel Davies, a former well known Kentucky coal man, has been appointed as a Federal conciliator to confer with miners and operators on the Mesaba iron range in Minnesota.

Malcolm H. Ganser, for a number of years connected with the city sales office of the Philadelphia & Reading Coal and Iron Co., has become associated with the sales forces of J. S. Wentz & Co., Land Title Building, Philadelphia.

R. J. Bryan, of Martins Ferry, Ohio, was recently appointed superintendent of the mine of the Barton Coal Co. He has been previously employed both as mine foreman and chief electrician at various mines in Belmont Co., Ohio.

Duncan McDonald, secretary-treasurer of the United Mine Workers of Illinois, states that the indications are for better conditions in the fall in the Illinois fields. Three or four of the larger mines in the Central Illinois district are expected to resume, although they will probably not run full time. Mines in the southern part of the state which have been closed down for nearly a year and a half, will probably reopen in September or October.

H. D. Thomas, who for the past 10 yr. has been connected with the Sunday Creek Co., with offices in Toledo, has severed his connection with that concern and accepted a position as assistant sales manager with the George M. Jones Co., an operating coal concern with its main offices in the Ohio Building, Toledo. His former position with the Sunday Creek Co. will be filled by J. R. Fitzer, of Columbus. Mr. Fitzer has been with the Sunday Creek Co. for a good many years. He does not expect to locate in Toledo but will look after this territory from the Columbus office.

OBITUARY

W. W. James, who in the early days of mining was superintendent of the Hazel and Hollywood collieries, died recently in Scranton at the age of 90 years.

John Tumulty, assistant mine foreman at the United mine of the H. C. Frick Coke Co. was recently killed by a fall of roof coal. It is said that this is the first serious accident to occur at the United mine in 10 years.

Andrew Grosko, possibly the oldest man in Pennsylvania, died on July 29. His family asserts that he was 105 years, 6 months and 24 days old. Grosko was in good health, and never had the service of a physician. He was a miner and had followed that occupation from boyhood. In 1886 he came from Austria to the Moshannon coal region, where he worked in the coal mines after reaching his 100th year.

RECENT COAL AND COKE PATENTS

Coal Jig. M. J. Gasper, Hazleton, Penn. 1,192,296, July 25, 1916. Filed Mar. 25, 1916. Serial No. 86,635.

Dumping Car. A. C. Murphy, New York, N. Y. 1,189,283, July 4, 1916. Filed Oct. 17, 1914. Serial No. 867,058.

Smoke Consumer. H. S. Ayling, Danville, Ill. 1,190,843, July 11, 1916. Filed Sept. 9, 1915. Serial No. 49,761.

Mechanical Stoker. A. G. Elvin, Somerville, N. J. 1,190,741, July 11, 1916. Filed Dec. 30, 1914. Serial No. 879,683.

Mining Machine. H. A. Kulin, Pittsburgh, Penn. 1,190,300, July 11, 1916. Filed May 18, 1914. Serial No. 839,328.

Coal Drilling Machine. Dan Armenti, Cleveland, Ohio. 1,189,901, July 4, 1916. Filed Sept. 4, 1915. Serial No. 49,048.

Carbide Miner's Lamp. J. B. Anton, Monongahela, Penn. 1,187,481, June 20, 1916. Filed Mar. 22, 1916. Serial No. 85,771.

Smoke Condenser. F. W. Breitenstein, Vancouver, B. C. 1,188,243, June 20, 1916. Filed Nov. 11, 1913. Serial No. 800,403.

Smoke Indicator. T. W. McNeill and I. J. Babcock, Chicago, Ill. 1,188,802, June 27, 1916. Filed Mar. 20, 1916. Serial No. 85,262.

Mine Shaft Gate. F. P. McClain and J. A. Fletcher, Rill-ton, Penn. 1,191,806, July 18, 1916. Filed Jan. 22, 1916. Serial No. 73,701.

Handling Mechanism for Mine Cars. A. Ferguson, Roscoe, Penn. 1,187,825, June 20, 1916. Filed Mar. 15, 1916. Serial No. 84,384.

Blower for Upright Water Tube Boilers. J. Magee, De-troit, Mich. 1,187,758, June 20, 1916. Filed July 23, 1914. Serial No. 852,768.

Process of Making Coke. H. W. Buhler and C. J. Emerson, Boston, Mass. 1,191,943, July 25, 1916. Filed Nov. 7, 1914. Serial No. 870,809.

Means for Sampling and Checking Miner's Coal. E. Ram-say, Birmingham, Ala. 1,191,227, July 18, 1916. Filed Apr. 6, 1914. Serial No. 830,092.

Automatic Gate Locking Device for Mine Shafts. G. A. Schreier, Springfield, Ill. 1,188,106, June 20, 1916. Filed Aug. 3, 1912. Serial No. 713,167.

Automatic Control for Flash Boilers. G. H. Hill, assignor to General Electric Co., Schenectady, N. Y. 1,190,167 July 4, 1916. Filed May 25, 1915. Serial No. 30,444.

Grate Mechanism. J. A. Bow and P. Thill, Great Falls, Mont., and A. E. Wheeler, London, Eng. 1,191,272, July 18, 1916. Filed Dec. 17, 1914. Serial No. 877,708.

Apparatus for Treating Coal and Other Hydrocarbonace-ous Substances. J. D. Scott, Detroit, Mich. 1,190,957, July 11, 1916. Filed Aug. 26, 1910. Serial No. 579,019.

INDUSTRIAL NEWS

Boston, Mass.—The schooner "Kenwood," of this city, has been chartered to load a cargo of coal at Philadelphia for Bahia. The terms are withheld.

Salt Lake City, Utah.—Le Roy Eccles and other heirs of the Eccles estate are planning for the opening of the mines of the Ketchum Coal Co., in Carbon Co.

Barbourville, Ky.—The first section of the new Cumber-land & Manchester R.R., to extend from this city to Manches-ter, Ky., has been opened for traffic. Twelve miles of the line have been completed and another 12 mi. is building.

Washington, D. C.—The Lehigh Valley Coal Sales Co. has petitioned the Interstate Commerce Commission to require the Lehigh Valley R.R. to refund \$319,658, alleged overcharges, which have been paid to it since the shipping rates went into effect on Apr. 1.

Philadelphia, Penn.—The ship "Thelma" left here recently with 700 tons of bituminous coal for Greenland. This is the first time coal has been shipped from here to within the Arctic Circle. The fuel is destined to Ivigtut where it will be used in mining cryolite.

Pittsburgh, Penn.—The readjustment committee of the Pittsburgh Coal Co. of New Jersey has extended until Aug. 15 the limit for exchanging preferred and common stock of the above company for those of the reorganization, the Pittsburgh Coal Co. of Pennsylvania.

Whitesburg, Ky.—Floods in the south and east have had a telling effect, it is said, on shipments of coal from the eastern Kentucky field, and railroads have been unable to handle shipments. Within 10 to 15 days everything will be righted according to an announcement.

Phillipi, W. Va.—The majority of the issue of \$841,000 in bonds of the West Virginia Co. are to be taken by a purchaser whose identity is not made known. The West Virginia Co. has taken up 29,000 acres in the Fairmont region, and it is understood that the new owners will commence immediate development.

Harrisburg, Penn.—The coal dredgers in the Susquehanna River have had a busy season until the work was recently interfered with by the unusual summer freshets in the river. One of the companies, the Anthracite Drifted Coal Co., has been taking from two to three carloads daily from the water near Parryville.

Wheeling, W. Va.—The Richland Coal Co., of Wheeling, W. Va., has started operations at a new mine located on Buffalo Creek near Wellsburg, W. Va. It has also entered into the lake business by the purchase of three lake vessels with a carrying capacity of 9,000 tons each trip which will make it a strong factor in the lake coal trade.

Cadiz, Ohio.—J. A. Klugston, of Philadelphia, representing a large Eastern coal company has been closing several deals for coal land in this county. He has negotiated the sale of

about 2,000 acres of coal of the lower vein. Test holes were put down before the coal was purchased as the company wished to be assured of the existence of the coal before pur-chasing.

Cleveland, Ohio.—Records on tonnage have been made by two Shenago boats during the past week. The steamer "J. M. Schoonmaker" was loaded with 14,409 tons of bituminous coal at Ashtabula consigned to Duluth. The steamer "Snyder, Jr.," was loaded with 13,544 tons of ore on its trip from Duluth. The two boats are sister ships and are of nominal 14,000 tons capacity.

Dott, W. Va.—The Turkey Gap and Coke Co. recently purchased the property of the Modoc Coal Mining Co., Springtown, W. Va., calling this the Modoc colliery. It is making extensive repairs and improvements, building new houses and tipple, repainting, etc. Additional new mine equipment will soon be delivered and it is expected the pro-duction will be increased at this plant at once.

Moundsville, W. Va.—On Saturday, Aug. 12, all the prop-erty both real and personal of the Mound City Coal Co., bank-rupt, will be sold at public auction at the front door of the Marshall County Court House in the city of Moundsville. This property consists of about 800 acres of coal land, rights-of-way, leasehold rights and other mining rights and mining privileges, also the surface property, tipple, buildings, etc.

Scranton, Penn.—Ellsworth Davis, a mining engineer, at the request of the school board made an examination of the No. 16 school in West Scranton, which has been seriously damaged by a cave-in. His report is that the building is unsafe and should be abandoned, as it may collapse at any time. The school was built 15 yr. ago at a cost of \$80,000, and in addition \$60,000 have been spent in repairs due to two previous cave-ins.

St. Louis, Mo.—R. W. Ropiequet, attorney for the St. Louis Coal Operators' Traffic Bureau, has received notice that the Interstate Commerce Commission has refused to disturb the rate on coal shipments from southern Illinois, western Ken-tucky and northwestern Alabama to Memphis, Tenn. The Alabama operators asked to have the rate increased 25c. a ton. The southern Illinois and western Kentucky operators resisted. Ropiequet was their attorney.

Louisville, Ky.—Announcement was made on July 28 that the Louisville Industrial Foundation capital stock of \$1,000,000 had been fully subscribed. This will be devoted to bringing new manufacturing enterprises to the city, where cheap fuel is one of the major inducements. Twenty-five thousand dol-lars in subscriptions were returned by one man in one day, the North Jellico Coal Co. making one of \$5,000. Numerous other coal operators have contributed generously to the fund.

Toronto, Canada.—Hon. Lorne A. Campbell, minister of mines for British Columbia, reports a great increase in the coal mining output of the province. Figures compiled from the latest data show that the production of coal on Vancouver Island and in the Crow's Nest Pass district for the first five months of the year exceed that for the corresponding pe-riod of 1915 by 45 per cent. The increase in coke shipments in the same period amounted to 48 per cent. over the corre-sponding period last year.

St. Louis, Mo.—Gov. Elliot W. Major of Missouri has asked the Interstate Commerce Commission to suspend a proposed lower freight rate on coal from Springfield and other Illinois points to Kansas City, Mo. The letter was written at the request of Missouri mine operators, who fear the decreased shipping cost would injure their business. The same condi-tions apply, the Governor says, to operators in Kansas, Iowa and Oklahoma. The proposed decrease is from \$1.90 to \$1.25 a ton, over the Chicago & Alton R.R.

Somerset, Penn.—Plans are under way for the construction of a water-power plant on the Stoneycreek River. The dams by which the water will be impounded will be constructed in the narrow gorges in the 5-mi. valley below Shanksville which are advantageously located for the purpose, the hills on both sides rising to a height of from 100 to 150 ft. Shanksville is between 300 and 400 ft. higher than Mostoller, assuring adequate fall for generating power for electric energy to be transmitted to the coal mines and towns in this region.

Chicago, Ill.—Eighty-three Kentucky and Tennessee coal-producing companies have asked the Interstate Commerce Commission for joint through rates on their production to Great Lake ports via Toledo and Sandusky. Joint Lake cargo rates are in effect from West Virginia territory, and Kentucky and Tennessee operators allege discrimination. Despite a 15c. differential, Kentucky coals are making marked headway at the head of the lakes, and Southern shippers feel that the elimination of this differential would have the effect of enlarging their Northern markets considerably.

Market Department

General Review

Over the country as a whole there has been no great change in either market conditions or consumption of coal. Hot weather has decreased the demand somewhat, but prices remain firm.

Anthracite—The general situation in anthracite is one of firmness, with consumption about keeping pace with production. A greater or less scarcity of this fuel is feared later on. Production has been somewhat interfered with by recent heavy rains in the anthracite region, and several collieries have been obliged to close down temporarily on account of flooding, caving and similar troubles directly chargeable to the excessive precipitation. Heavy shipments also have been made both east and west. These have curtailed somewhat deliveries to Philadelphia and contiguous territory, and a mild scarcity of this coal is deemed imminent. Other factors tending to tighten the market are car and labor shortage, both of which are being more or less felt over a wide area of the country.

Bituminous—Pocahontas and New River coals on account of the recent floods are still somewhat short in supply at Newport News. As a result the prices of these fuels in New England are firm. Shipments of Georges Creek coals are slow, while the movement of Pennsylvania grades is practically unchanged. In New York and its vicinity soft coal is in good demand, with prices tight, dealers hesitating before accepting large orders. In Philadelphia and vicinity the bituminous prices have moved upward, with indications of a still further advance. Coal men in Baltimore are in some instances refusing new business and the trade as a whole is tighter. Labor and car scarcity is somewhat injuring this trade, while business is developing which apparently nobody wants. Dumpings over the piers at Hampton Roads for July were lighter than those for June and a shortage of coal is still seriously felt. This is due in large measure to the floods in the coal regions tributary to this port. Export demand and coastwise shipments have been good, and while there has been some delay on export delivery, there has been none on bunkering fuel. The local market for Pocahontas and New River is approximately normal. The market in Pittsburgh is slightly stronger, and while the demand for steam and domestic fuel is light, the prices are well maintained. A car shortage in the western Pennsylvania region has caused a slowness of deliveries as well as temporary suspension of work at some collieries. Cleveland reports an active demand for slack, while a car shortage is being seriously felt. The intense heat which has been existing between the Rocky and the Allegheny Mountains is having a somewhat depressing effect upon the demand for domestic coal. On the other hand, the demand for steam fuel is approximately what it has been and prices of all grades are well maintained. A car and labor shortage is also being felt throughout the territory east of the Mississippi and north of the Ohio, while it extends to the eastern Kentucky and West Virginian fields south of that river.

Lake Trade—The demand for Lake coal is greater than it has ever been before this season, and this has had a somewhat stabilizing effect upon the coal market. Boats are as heretofore somewhat difficult to secure. This is particularly true for deliveries to Lake Michigan.

Middle Western—Dealers complain that domestic buying is extremely dull. This is probably in large measure due to the hot weather which has prevailed throughout the Middle West during the past week. This has also to a certain extent retarded steam coal activities and production throughout the Illinois field has been somewhat curtailed. A labor shortage is being felt by the retailers as well as operators and, in some instances, it is impossible to secure adequate labor for unloading and storing coal in the yards. There has been practically no change in prices, however, and in many instances these show a slight tendency to advance, particularly for certain grades and qualities.

A Year Ago—Anthracite continues heavy, though operations are increased. The boom in steel and the new restriction on British exports are the predominating features in the bituminous situation. Less favorable crop outlook a depressing factor.

Business Opinions

Boston News Bureau—Wealth has been, and is, pouring into this country, but with all this there is no disposition to expand beyond the safety line. Which is to say that we appreciate the enormity of the European War, the terrific loss of life and property and the huge increase in indebtedness. Two years of war have caused us to be alive to the world situation today.

The war has brought us prosperity beyond any dreams we may have had, but we are husbanding our resources because of the uncertainties of the future. In such times, however, it is difficult to economize to any extent. Prices of raw products are abnormally high; prices for labor are almost prohibitive and labor is still demanding more.

At present we are beginning to discount the return of peace, although there is nothing in sight to indicate any willingness on the part of the allies to slacken hostilities until Germany is decisively beaten.

Under these conditions it is natural that there should be no speculative impulse. It is too apparent that we will be obliged to furnish the allies with more money, either by loans or the purchase of American securities, to warrant any sustained upward movement in securities.

Fortunately the ban has been placed upon over-speculation and over-valuation. We are now in a resting position waiting for new developments. It is a time that calls for financial strength and sound judgment.

When the end of the war is seen to be actually approaching, there will be an opportunity to strike a balance between the changed conditions which will accompany peace.

Marshall Field & Co.—Current wholesale distribution of dry goods has been in excess of the corresponding period of a year ago. Buyers have attended the market in much larger numbers, many of them coming from the South and West. Great interest is being shown in Chicago Market Week and Fashion Show to be held Aug. 7 to 12 and an unusually large number of merchants are expected. Collections are ahead of the same period last year.

The American Wool and Cotton Reporter—Quiet, but strong, is the condition of the wool market. The demand seems to have been, during the week under review, more for domestic wools than for foreign, and a good proportion of the sales was in territory wools. Sales, however, were distributed over practically all kinds of wools. Most of the new clip has been bought up and shipped to the East from the West, but there is still a comparatively small amount left in Montana. Some dealers do not care to sell any tops for fall delivery unless they receive from 5 to 8c. more than for the same grades at present.

The woolen goods market has been more active during the week under review and the situation appears somewhat more favorable than during previous weeks. Altogether the woolen goods market is strong and likely to remain so because there are practically no developments which can occur to make prices much lower.

Dun—Such striking and uniform gains appear in comparison with results at this period in best previous years that the outlook can only be regarded with optimism. Existing conditions in trade and industry are noteworthy for the remarkable activity shown at the approach of midsummer, but the most gratifying feature is the avoidance of speculative excesses and overextension in nearly all undertakings. While the magnitude of forward engagements testifies to the widespread confidence in the future, business interests still display commendable judgment and prudence in confining commitments within the limits of safety. This policy of conservatism accentuates the underlying strength of the situation, and is one of the strongest factors making for sustained economic progress.

Bradstreet—Trade does not pause nor does there seem any doubt as to the future. Even in sections, the Northwest for example, where talk of damage to wheat is most rife, buying pursues the even tenor of its way, and, indeed, purchases for fall are earlier and heavier than a year ago. In fact trends in general, except in the rain-swept parts of the southeast, indicate that buying for immediate shipment is comparatively good, while ordering for fall delivery is growing and will be heavier during the first fortnight of August.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River still short at Hampton Roads and prices firm. Export inquiry good, but shippers cautious about guaranteeing dispatch. Georges Creek shipments slow. Pennsylvania grades unchanged. Shortage feared in anthracite.

Bituminous—The movement of Pocahontas and New River coals to the piers is still hampered by the flood damage of a fortnight ago and most of the agencies are seriously short of coal to clear steamers. Slow loading will probably be the rule for at least a fortnight longer. In scattered instances cargoes have been cleared with reasonable promptness but on most tonnage there has been delay of three to five days. Some coastwise steamers have been diverted to other ports pending improvement at Hampton Roads.

Prices are accordingly quite firm f.o.b., only a few shippers being willing to make concessions for \$3, and then only for August. There is also a growing caution against guaranteeing loading within a specified time, and already contract stipulations of that nature are being waived by consignees or steamer owners anxious for coal.

Inquiry is better, especially for export. There are continued rumors of large orders from foreign governments, some of them being re-orders in cases where shippers are alleged not to have met requirements, but careful sifting is required to separate genuine inquiries from the other kind.

Georges Creek shipments are still coming forward slowly, due mainly to the shortage of bottoms and the unfavorable weather. The steamer "Plymouth," usually plying to Alexandria, Egypt, was diverted for one trip, Baltimore to Boston, as part of the effort on the part of shippers to make up the arrears here on Georges Creek contracts.

Grades from the Pennsylvania districts have shown no particular price movement as yet, except for futures. For deliveries through October and November certain of the Cambria and Somerset coals have been marked up 15c. or so. For spot coal, however, prices are about the same as last quoted. Inquiry on all rail shipments is good and prices remunerative. Several of the highest grade coals are out of the market except for small tonnages.

Bituminous quotations at wholesale, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfield	\$2.35@2.85	\$2.65@3.15		\$1.10@1.60
Cambria and Somersets	2.60@3.00	2.90@3.30		1.35@1.75
Georges Creek (contract)	3.07@3.17	3.37@3.47	\$3.00@3.10	2.00@2.10

Pocahontas and New River, f.o.b. Norfolk and Newport News, Va., are \$2.90@3. On cars Providence and Boston prices are \$4.90@5.10.

Anthracite—Apprehension over a probable shortage in the fall and winter is increasing among the trade. It is realized that the time lost by slow movement along the coast cannot be made up and that more than a few dealers will be behind their usual quota.

The only thing to offset this is the admitted fact that retail purchases were heavy all last season in anticipation of an anthracite strike. In the large cities particularly this is a factor in the outlook. There is a well-defined fear that company barge freights from the loading ports will be advanced over the 50@55c. rate that still prevails. On this account retailers are conservative in quotations for future deliveries.

The latter half of July was a great disappointment in receipts at Tidewater in this territory. All-rail shipments latterly have been particularly good.

NEW YORK

Anthracite situation remains strong. Chestnut tighter and pea moving well. Soft coal in good demand with prices firm. Shippers hesitating before accepting large orders.

Anthracite—There has been no let-up in the anthracite situation. Demand is good in other sections of the country but slow at Tidewater. Supply here is not large but sufficient to meet all requirements.

There is no great stir on the part of dealers to prepare for the rush that is sure to come early next month but there are operators who already hesitate before accepting orders for the prepared sizes for immediate delivery. They point to the labor and car conditions as they believe these will become worse instead of better.

Demand from the West is heavy and operators are finding a ready market for spare tonnages. There is much activity in the New England states but heavy shipments by rail are interfered with by embargo orders which are frequently placed.

Shipments by water are heavy but bottoms are scarce, so many boats being used in other lines, and rates are high for those available.

There is but little trouble in moving egg and stove, but chestnut coal is long and even this is in better shape than a week ago. There are shippers who accept orders for egg and stove only on condition that some chestnut shall be included in the order.

Some individuals are letting their supply go at from 15 to 25c. off regular schedule. Pea coal is moving fairly well but concessions of from 10 to 15c. are reported.

The buckwheat coals are in excellent condition. The good grades of No. 1 Buckwheat are short, while the cheap coals are practically out of the market. Buckwheat No. 2 is in plentiful supply with small concessions being made to move it. Barley or Buckwheat No. 3 is moving well.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual		Circular	Individual
Broken.....	\$4.95		Pea.....	\$3.90	\$3.75@3.90
Egg.....	5.35	\$5.35	Buck.....	2.75	2.65@2.75
Stove.....	5.55		Rice.....	2.20	2.10@2.20
Nut.....	5.65	5.40@5.65	Barley.....	1.95	1.80@1.95
			Boiler.....	2.20	

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The activity which has existed in the bituminous market for the past few weeks continues. There has been no letup in demand and prices remain firm. Buyers for large consumers are invading the market for bargains but find few. Free coals are quickly picked up. There are those who look for more strength. Some few grades show a slight increase over last week's prices but these are for individual shipments.

The supplies at Tidewater are not large. Some of the better grades are practically out of the market while the cheaper grades are being held firm with little being let go at less than \$2.95 f.o.b. The better grades are held firm at from 10 to 30c. higher. Some shippers are hesitating before taking orders for immediate delivery.

Current quotations for various grades, gross tons, f.o.b. Tidewater follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein..	\$3.50@3.65	\$3.50@3.65	\$3.50@3.65	\$1.95@2.10
Georges Creek Tyson.....	3.10@3.30	3.10@3.30	3.10@3.30	1.55@1.75
Clearfield: Medium.....	3.00@3.20	3.00@3.20		1.45@1.65
South Forks.....	3.30@3.50			1.75@1.95
Nanty Glo.....	3.10@3.20			1.55@1.65
Somerset County: Medium.....	3.00@3.10	3.00@3.10	3.00@3.10	1.45@1.55
Quemahoning.....		3.10@3.25	3.10@3.25	1.55@1.70
West Virginia Fairmont 1		3.00@3.10	3.00@3.10	1.20@1.30
Fairmont mine run.....		3.00@3.10	3.00@3.10	1.20@1.30
Western Maryland.....		2.95@3.00	2.95@3.00	1.40@1.45

PHILADELPHIA

Anthracite hampered by floods. Big shipments East and West curtail local deliveries. Prices strong, except on nut. Scarcity of coal imminent. August circulars out. Bituminous prices move upward, with indications of further advance.

Anthracite—The heavy rains throughout the region have added to the operators' troubles and greatly curtailed the already short production. Many of the collieries were shut down for the best part of a week and a number of them have not at this writing resumed.

The dealers in this city who receive a large tonnage via canal have been hard hit by the above conditions, as the banks of the Lehigh canal have been damaged to such an extent that it will take several weeks before repairs can be made and in the meantime the dealers on the water front will be shut off from that source of supply. The tonnage was badly needed to help out the railroad situation and its loss is causing much dissatisfaction to the trade.

The early part of August finds the local market rather dull, especially with the retailers. There are no large orders being placed, but numerous ones for a few cars each, which with the scarcity of coal is sufficient to keep things going.

The demand for coal both by the eastern and western markets continues strong, and before they are satisfied the conditions here will have to change materially, for there still seems to be no doubt that the fall business will commence earlier than usual.

Thousands of tons will soon be ordered on which there might have been a saving to the retail dealers of 30c. per ton. The individuals are taking it for granted that they will get \$3 for their pea coal this winter. Stove is another size which gives evidence of being short. However, as to this size no blame can be placed on the dealer for being short if he is not carrying it in sufficient quantities, for at no time this year has it been in surplus or when it could have been shipped in large quantities.

Egg, too, has held its own unusually late this year and this size, so often attacked by the cutters, has advanced regularly each month. It is not supposed that orders for either of these sizes have been placed at off prices since early in June.

With chestnut conditions are entirely different. The demand locally is light and the price would gladly be cut 15@20c. by certain shippers on an order of fair size.

The steam coals are doing fairly well, but buckwheat is the only size in any particular demand, although even this is not urgent.

The August prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide shipment are as follows:

	Line	Tide		Line	Tide
Broken.....	\$3.60	\$4.75	Buckwheat.....	\$1.65	\$2.55
Egg.....	4.05	5.15	Rice.....	1.00	
Stone.....	4.30	5.40	Boiler.....	.90	1.80
Chestnut.....	4.40	5.45	Barley.....	.75	
Pea.....	2.70	3.60			

Bituminous—The trade goes into August with the prices of all grades in a strong position. The slight upward movement begun a few weeks ago continues and while the changes within the last few days have not been many, yet the tendency is favorable and there is an increasing demand for coal.

The car supply is once more becoming a serious problem and at times the operations in the Western Pennsylvania section have only had about a 35 per cent. allotment of cars. Most shippers report good orders in hand, but are much disappointed in not being able to fill them promptly. The prices per gross ton at the mines are about as follows:

Georges Creek Big Vein..	\$1.90@2.00	Fairmont gas, 1.....	\$1.65@1.75
South Fork Miller Vein..	1.70@1.80	Fairmont gas, mine-run..	1.45@1.55
Clearfield (ordinary)....	1.40@1.50	Fairmont gas, slack.....	1.20@1.25
Somerset (ordinary).....	1.35@1.40	Fairmont lump, ordinary..	1.40@1.50
West Va. Freeport.....	1.25@1.30	Fairmont mine-run.....	1.25@1.35
		Fairmont slack.....	1.20@1.25

BALTIMORE

Trade still tighter and coal men are refusing new business. Labor and car scarcity hurts the trade. Anthracite men too are feeling the pinch even though demand is light.

Bituminous—The situation in the coal trade here is highly interesting, principally because new business is now developing which no one seems to want. Many coal shippers here report that they can only get coal from certain mines in small quantities and as a favor. These shippers, and producers, as well, have their hands full in the face of short labor and short car supply in keeping their regular customers and contracts covered properly.

Prices to the trade are about as follows, at the mines, per gross ton: Georges Creek, Tyson, \$1.75; Miller vein, \$1.50; Quemahoning, \$1.55@1.60; Somerset, \$1.50; Freeport, \$1.30; Fairmont, gas, three-quarter, \$1.35; same, mine-run, \$1.20@1.25; slack, \$1.10@1.15.

Anthracite—Dealers here are complaining more and more that they are not getting coals as desired. Many firms that had wished to deliver from cars to homes during July are still awaiting shipments of sufficient bulk to care for their needs. This is all the more significant when it is known that the demand has been below the seasonal average. It also presages a lively time this fall when demand will undoubtedly far outstrip supply for the time being.

HAMPTON ROADS

Dumpings for July lighter than June. Shortage of coal still seriously felt. Export demand and coastwise shipments good. Local market for Pocahontas and New River normal. Anthracite dull.

As will be noted from the following figures, the tonnage dumped over the piers of the three coal-carrying roads for July is considerably less than for the preceding month. This is to be accounted for in large measure by the recent floods and washouts, the Norfolk & Western, which shows practically all of the decrease, being the heaviest sufferer. With the orders in hand, it is felt by the trade that August will show up well.

Coastwise tonnage is increasing, principally to New England ports, and is in better demand. Contract customers are taking the tonnage due under their contracts and new business is also evident.

The demands of bunker steamers during the past week have been heavy. While cargo steamers have been delayed, there have been no delays to steamers bunkering.

The local market for Pocahontas and New River is normal for this season. The tonnage is fairly constant throughout the year, with the exception of the small amount used for domestic purposes.

Anthracite still shows its usual summer dullness.

Prices are firmer, being quoted as follows: Pocahontas and New River, for cargo, \$2.85@3 per gross ton; for local

consumption, \$2.75 per net ton, on tracks in carload lots; bunker coal, \$3.30 per gross ton, plus 10c. per ton trimming for ordinary steamers. Anthracite is \$7.50 per net ton, delivered.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

Railroad	Week Ending				
	July 1	July 8	July 15	July 22	July 29
Norfolk & Western....	160,108	114,026	173,347	108,108	139,132
Chesapeake & Ohio....	70,905	91,311	.....	133,897	76,517
Virginian.....	94,029	94,016	90,989	73,870	80,341
Totals.....	325,032	299,353	.....	315,875	259,990

The dumpings for the month of July were as follows: Norfolk & Western, 607,446; Chesapeake & Ohio, 442,194; Virginian, 376,649; a total of 1,428,289 tons.

Ocean Charters and Freights

VESSEL CLEARANCES

NORFOLK			NEWPORT NEWS—Continued		
Vessel	Destination	Tons	Vessel	Destination	Tons
Constantinople ¹	Genoa	2,157	Maella ⁴	Santos	2,446
Reno ¹	Genoa	2,993	Edison Light ⁴	St. Nazaire	2,986
Venus ¹	Italy (any port)	5,280	Cire ¹	Italy (any port)	3,919
Amanda ¹	Naples	6,184			
George M. Em- brios ⁶	Buenos Aires	4,885	Fede	Italy	1,062
Tordenskjold ¹⁷	Barbados	5,434	Lamington	Argentina	5,139
Edward B. Winslow ²	Rio Janeiro	5,027	Giovanni	Italy	689
General S. A. A. ¹⁶	Porto Vecchia	3,659	Alvanese	Argentina	3,200
Lord Down- shire ⁸	Buenos Aires	5,185	Petra	Cuba	1,989
Torrington ¹⁰	Genoa	7,738	Garibaldi	Italy	.....
Glenrahan ⁶	Buenos Aires	6,404			
Capra ¹	Porto Ferrajo	6,146			
Fukoku Maru ⁶	Guantanamo	6,530			
Sahara ²¹	Mejillones	5,622			
Warren ⁷	Montevideo	5,167			

NEWPORT NEWS

Honduras ⁴	San Juan	2,815			
Llandrindod ¹⁸	Buenos Aires	5,334			

¹ Atwater & Co.	⁶ Ches. & O. C. & C. Co.	¹⁶ New River Coal Co.
² Baker Whiteley	⁷ Crozer-Pocahontas Co.	¹⁷ Pocahontas Fuel Co.
³ Barber & Co.	⁸ Dexter & Carpenter	¹⁸ Smokeless Fuel Co.
⁴ Berwind-White	⁹ Flat Top Fuel Co.	¹⁹ C. H. Sprague & Son
⁵ C. G. Blake Co.	¹⁰ Hasler Brothers	²⁰ White Oak Coal Co.
⁶ Castner, Cur. & Bul.	¹¹ Houston Coal Co.	²¹ Northern Coal Co.
⁷ Ches. & O. Coal A. Co.	¹² Maryland C. & C. Co.	

OCEAN CHARTERS

Coal freight charters have been reported as follows:

BALTIMORE*				PHILADELPHIA			
Vessel	Destination	Tons	Rate	Vessel	Destination	Tons	Rate
Port Curtis, Br.	River	2,998	\$15.20	Republic	Rio Grande	.....	.....
Highbury, Br.	Plate	3,026		Gladys B. Smith	do Sul	680	\$20.00
Hartfield, Br.	Aires	2,835	15.20		Lunenburg, N. S.	100	3.50
Raequais, Chile	Valparaiso	1,292					
Petra, Nor. Cuba	Chile	2,359	18.25				
Lynorta, Br.	Valparaiso	3,802					
Rancagua							

VIRGINIA

Exford	River Plate	2,839	\$15.15 ²				
Sama	Jamaica	936					
Henry F. Kreger	Lisbon	991					
Erik II	Para	1,202	14.00 ³				
Tordenskjold	Barbados	2,295					

OCEAN FREIGHTS

Export coal chartering has been very dull during the week, as is usual at this season of year, and the few charters that we have effected (none of which has been reported) were at or about rates recently quoted. We would quote freight rates on coal by steamer as follows:

West Coast of Italy...	\$27.95 about	Cienfuegos.....	\$5.00@5.25
Marseilles.....	26.75 about	Port au Spain, Trinidad	5.75 about
Barcelona**	23.10 about	St. Lucia.....	5.75 about
Montevideo.....	15.80@17.00	St. Thomas.....	5.25 about
Buenos Aires or La Plata.....	15.80@17.00	Barbados.....	5.75 about
Rosario.....	18.75 about	Kingston.....	5.00@5.50
Rio Janeiro ⁴	16.50 about	Curacao.....	5.00 about
Santos ⁵	17.00 about	Santiago.....	5.00@5.50
Chile ¹ (good port).....	11.00 about	Guantanamo.....	5.00@5.50
Havana.....	3.80 about	Bermuda.....	4.25@4.50
Cardenas or Sagua.....	5.00 about	Vera Cruz.....	5.00@5.50
		Tampico.....	5.00@5.50

* Consignees paying dockage dues. ** Spanish dues for account of cargo. ¹ 500 tons discharge. ² 400 tons discharge. ³ And p.e. ⁴ Net, 1,000 tons discharge. ⁵ Or other good Spanish port.

Note. Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight R. port.

LAKE MARKETS

PITTSBURGH

Market slightly stronger. Lake shipments heaviest of season. Slack price keeps up. Steam and domestic in light demand.

The coal market is a trifle stiffer this week, although there is no appreciable increase in demand. There is a delicate balance between production and regular contract requirements whereby little prompt coal is offered. Shipments in the Lake trade are now by far the heaviest thus far this season, and regular manufacturing consumers are taking full quotas.

Domestic consumption, of course, is extremely light. Ordinary steam coal can usually be had down to \$1.35, with odd lots at \$1.30, while Youghiogheny gas brings up to \$1.45, all for mine-run.

Slack maintains a fair price despite the increased production, and is generally held at \$1, although Pan Handle might be had at 5 or 10c. less. The circular price remains \$1.50 for mine-run.

We quote prompt coal as follows: Slack, 95¢@1; mine-run, \$1.35@1.45; ¾-in., \$1.45@1.55; 1¼-in., \$1.55@1.65, per net ton at mine, Pittsburgh district.

BUFFALO

Jobbers complain of scarcity of orders and slowness of deliveries. Car shortage causes suspension of work. Anthracite consumers are holding aloof. Lake trade booming.

Bituminous—Reports continue to be puzzling, due to jobbers' statements that they are not getting new orders readily and that if they get cars unsold on track it is hard to dispose of them. On the other hand, if they give orders to mines which have solicited them it is usually a long time before they are filled. The condition can probably be accounted for by the supposition that consumers decline to stock up when prices are rather high and when they have fair supplies and are contracted liberally. Jobbers have for a long time been predicting higher prices in view of slow mining, but they are merely holding their own.

There are no changes in the general situation, but prices are strong for all but mine-run, as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump.....	\$2.95	\$2.75	\$2.80
Three-quarter.....	2.85	2.60	.....
Mine run.....	2.75	2.50	2.60
Slack.....	2.40	2.30	2.60

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—The trade is light but steady. Consumers will not buy supplies in advance of their needs unless conditions are especially inviting, seeming rather to prefer to take their chances next November for their coal supply, when everybody will want to stock immediately.

As August ends the summer price reduction, it is expected that before the end of the month there will be a spurt of some volume. Independent prices are somewhat higher than the following regular quotations:

Grate	\$5.85	Chestnut	\$6.35
Egg	6.10	Pea	5.00
Stove	6.10	Buckwheat	3.50

The August discount from these figures is 10c. per gross ton. For delivery on shipboard 25c. a ton is added.

CLEVELAND

Big demand for slack coal. Car shortage being felt. Lake situation changing for better movement of coal.

Prices have stiffened, especially on slack, due to the car shortage. The supply has fallen off at a serious rate, and every one who buys slack in the open market is attempting to buy as much slack as he can, for shipments to run as long as possible, at prices below \$1, which is the contract basis for this grade here.

This market, which in past years has always had more or less coal on track which was shipped as consignment coal and which naturally had a tendency to hurt the market, is now free of it, and consequently prices have held firm.

Following are the prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8.....	\$2.10	\$2.00	\$1.90@1.95
Cambridge.....	2.10	2.00	1.90
Middle Dist.....	2.00	1.90	1.80@1.85
Hocking.....	.....	.....	1.80
Youghiogheny.....	2.60	2.50	.....
Pittsburgh.....	2.60	2.50	.....
Pocahontas.....	.....	2.70	.....
Fairmont.....	2.10	2.00	1.90@1.95

TOLEDO

Steam-coal market good. Prices firm. Domestic sizes drag. Lake coal movement large.

Although the mercury is hovering about the hundred mark coal dealers are still cheerful, which would seem to be a favorable business indication. The biggest complaint is of labor shortage. There is no great movement of domestic coal at present, as consumers are not inclined to put in much coal this summer. The increase in the price of anthracite evidently has had the result of stopping buying, as people seem inclined to the opinion that cheaper coal will come later. Wholesalers, of course, declare that nothing of the sort can be looked for.

Soft-coal dealers seem to be well stocked and have not been unloading fast enough to facilitate early buying. Some threshing coal is now being sold, but not enough to make any deep impress upon the market. The steam market is in much better condition than the domestic, and prices are firm.

There is plenty of coal on track and on local docks for Lake shipment, but the percentage of commercial coal is small.

Coal dealers are extremely optimistic, and are anticipating a prosperous season. The lake movement has never been better than at present.

DETROIT

Consumption of steam coal diminishes. Demand for domestic stock is slow. Anthracite sales are light. Lake shippers get few boats.

Bituminous—The consumption of steam coal in industrial plants and factories has been considerably reduced by the hot weather, which makes it almost impossible for the factories to operate at capacity, because of the absence of a large part of their working forces. Nut, pea and slack retain first place in volume of sales, the prices holding closely around the equivalent of 90c. at the mines. There is a slight demand for mine-run at \$1.15 at the mines, freight to be added. Very little buying is apparent in the domestic trade by either consumers or retailers. Stocks of coal coming to Detroit for sale on tracks are now not excessive.

Anthracite—Consumers of anthracite are not buying freely, and deliveries to householders are far behind their normal volume. Retail dealers display no desire to complete winter stocks even though wholesalers continue to predict that buyers are likely to encounter difficulty in supplying their wants later.

Lake Trade—Coal for Lake shipment is moving more freely to the lower Lake docks, but shippers are encountering great difficulty in closing charters for boats. The only vessels available are those for which contracts were closed earlier in the season. On shipments of moderate size to Portage, Lake Superior, a rate of 50c. was paid.

COLUMBUS

Domestic trade is showing some improvement, although the hot spell is holding it back. Prices are generally well maintained and future prospects are good.

The feature of the coal trade in Ohio during the past week has been the increase in the demand for domestic sizes. While the heat spell is holding back the stocking movement to a large degree, still there is a good demand for all domestic grades. Pocahontas is selling well and the same is true of West Virginia splint.

Production in Ohio fields is holding up fairly well and there is a marked increase in tonnage reported from the Hocking Valley district. Eastern Ohio is producing quite a good tonnage and the same is true of Massillon and Tuscarawas. The strictly domestic fields are not as active as other fields.

Prices on short tons, f.o.b. mines, are as follows:

	Hock-Pom- ing eroy Ohio	East Ohio	Hock-Pom- ing eroy Ohio	East Ohio
Re-screened lump.....	\$1.60	\$1.70	.....	.....
Inch and a quarter.....	1.50	1.50	\$1.40	.....
Three-quarter-inch.....	1.35	1.35	1.35	.....
Nut.....	1.25	1.25	1.25	.....
Egg.....	.....	.....	.....	.....
Mine-run.....	.....	.....	.....	.....
Nut, pea and slack.....	.....	.....	.....	.....
Coarse slack.....	.....	.....	.....	.....

CINCINNATI

Despite adverse weather, market continues strong and active, with steam grades in good demand. Car and labor shortage and the difficulty of moving shipments are strengthening factors.

The outstanding feature of the market just now is the fact that buyers are more anxious than sellers, in marked contrast to the condition at this season during the past year or two. The number of coal concerns which have disposed of virtually their entire output on contract is large, and wholesalers and operators with coal available for the spot market are not in any difficulty about disposing of it.

Transportation difficulties are increasing, however, the car supply in some quarters last week being reported as worse than for some time, while congestion at the Lake ports,

embargoes on many lines and the trouble experienced in finding labor to unload cars make a combination of handicaps in the movement of coal which is distinctly unusual.

Demand in the local market is satisfactory, although the sultry weather has naturally discouraged domestic consumption. Prices are good, and it is practically certain that they will remain so, in view of the situation outlined above and the steady approach of the normally heavy buying season.

LOUISVILLE

Car shortage temporarily reduces eastern Kentucky output. Heat wave exerting depressing influence. Wide variance in prices.

The car shortage during the week has sharply affected the output of the eastern Kentucky coal mines. Districts served by the Louisville & Nashville have been deprived of a thousand coal cars diverted to hauling slag for rebuilding the storm ravaged southern lines of the company, and the Bell County field is getting Southern Ry. cars for only one or two days a week as a result of the Carolina floods. The heat is having a somewhat depressing effect, not only on domestic, but also on the industrial market. No improvement is reported in the labor situation.

Prices at the beginning of August range about as follows, f.o.b. mines, long-ton basis: Block, \$1.60@1.85; block and lump, \$1.40@1.60; 2x4-in. egg, \$1.15@1.35; mine-run, around \$1; high-grade nut and slack, 85@90c. No price changes are reported in the western Kentucky field, which is still dull.

COKE

CONNELLSVILLE

Spot coke easier through better railroad movement, and prices a trifle lower. Two large byproduct coke plants to be completed in August. Production and shipments substantially unchanged.

The mild scarcity of furnace coke has been relieved somewhat in the past week, and the furnaces now appear to be in a comfortable position. For several weeks a number of them had been pressing shippers for better deliveries, and there was more or less buying on the part of jobbers to fill in on their contracts. The movement was slow, an usually large amount of coke being in transit. The improvement in the railroad situation, however, has resulted in considerably better deliveries. Standard grade furnace coke for spot shipment is in small demand, and has been picked up within the past few days as low as \$2.50, while for a time it was hard to buy at \$2.75.

There are rumors of a little contract business having been done in the past week, but they cannot be confirmed. In general the market is very quiet with regard to contract furnace coke.

Foundry coke is in moderate demand at unchanged prices. We quote: Spot furnace, \$2.50@2.65; contract, \$2.35@2.50; spot foundry, \$3@3.25; contract, \$3.25@3.50, per net ton at ovens.

Coal shipments have been moving for the past two weeks to the new 204-oven byproduct coke plant of the Youngstown Sheet and Tube Co. at Youngstown, Ohio. Half the plant is expected to start operating next week, the other half within a fortnight. The River Furnace Co., Cleveland, will probably start its 204-oven plant before the end of the month. With the opening of these plants a corresponding amount of Connelville coking capacity will be released, but the major part of the coal consumed will come from the Connelville region.

The "Courier" reports production in the Connelville and lower Connelville region in the week ended July 22 at 413,280 tons, a decrease of 4,736 tons, and shipments at 412,021 tons, a decrease of 5,226 tons.

Buffalo—The stiff prices of a week ago still continue. There has been an increased demand for water shipment, and the men are suffering at the ovens on account of the hot weather. Quotations are on a strong market at \$5.10 for 72-hr. foundry, \$4.60 for 48-hr. furnace, \$4.25 for high sulphur and \$4.10 for stock.

Baltimore—The coke market is much brighter. A number of export coke shipments seem to have aided the situation. Coke the past week was being sought instead of seeking customers. Little prospect existed of finding an adequate supply.

Chicago—Domestic sizes are selling at premium prices. By-product ovens are still having trouble in making deliveries. Spot foundry coke remains unchanged. Prices per net ton of 2,000 lb., f.o.b. cars Chicago, are as follows:

Connellsville	\$6.00@6.25
Wise County	6.00@6.25
Byproduct foundry	6.00@6.25
Byproduct domestic	4.95@5.30
Gas house	4.50@4.75

MIDDLE WESTERN

GENERAL REVIEW

Domestic buying extremely dull. Hot weather retards steam-coal activity. Production curtailed. Labor shortage affects retailers as well as operators.

Western domestic demand in both city and country still lags owing to hot weather. Wholesalers are able to obtain only a few small orders for domestic sizes and cannot arouse the retailers from the attitude of indifference which has prevailed so far this summer. Consumers are not buying, and the retailers appear to follow a waiting policy, hoping that this may bring an opportunity later to buy at lower prices. Warnings issued by shippers that higher prices will prevail with shortage of supply seem to cause no uneasiness.

Continued high temperatures have also served to check somewhat steam coal buying. Industrial plants and factories employing large forces of men lack full complements of workmen, with the consequent shortening of output. Contracts are absorbing almost the entire amount of screenings production, although steam lump is inclined toward comparative dullness. Screenings have not advanced, but have been averaging around the old price of \$1.

The intense heat in various Western cities has also retarded deliveries from retail yards to consumers. The contract situation is more stringent, and many small consumers who tried to get under cover at the close of the month have been unable to do so, the reason given to them being that the mines are sold up.

Production this week has been curtailed about 25 per cent. as compared with last week. A large amount of 6-in. lump is being held at Illinois mines unsold, as no disposition is evinced to ship this accumulation at a break in price. Eastern free coal is absent in Western distributing centers. Output is being reduced in some Western districts because of an insufficient labor supply, and in other sections the lack of cars is noticeable.

Inability to obtain sufficient workmen for the mines promises to be continuous throughout the year, and as a result wholesalers predict strenuous times in Western coal markets this fall. The shortage of men is also causing retailers considerable trouble in unloading coal, and this is acting as an embargo on orders from the retail trade.

Lake freight rates continue strong, with every indication of reaching a higher range before the end of the season. Many coal cargoes are wanted, but there are few vessels to meet the demand.

CHICAGO

Domestic demand in Chicago without life. Steam coal absorption slightly reduced. No change in prices. Anthracite shows improvement.

The demand for domestic sizes from Williamson and Franklin Counties has dropped off considerably on account of high temperatures. Southern Illinois steam sizes are being shipped as rapidly as produced, and prices range between 95c. and \$1. Fine coals from Saline County are a little stronger than last week. No. 1 washed coal from the Cartersville district is backward.

Better buying of steam coal, particularly screenings, from the central Illinois district is noticeable. The Wabash Railroad has not yet covered its requirements by contracts with Springfield operators in an effort to obtain lower prices, as the operators refused to cut their figures, and the Wabash is now buying its requirements in adjoining fields.

Mines in the Lincoln district which have been idle are making preparations to reopen. Orders have recently accumulated, and operators in central Illinois are looking forward to a busy season. It is expected that all mines will be hoisting coal by the end of August.

Indiana shipments increased this week. Prices are firm, and operators believe that higher prices will prevail early in August. Indications point to the railways taking more coal earlier this year than ever before in the fall season. A number of large developments in the Clinton field are projected. Industrial steam coal orders are heavy, and the Indiana coal trade has a bright outlook. Steam coals from all districts are especially strong, with screenings in the lead.

Pocahontas and New River mine-run is scarce, and in some instances shippers seem unable to meet local contract orders. Doubtless the new August price of \$1.50 will meet no resistance. Prepared sizes are not so strong, sales of lump and egg being around \$1.90. Pennsylvania smokeless has stiffened, and more of it seems to be going into the country districts.

Hocking is showing betterment. Prices are firm, ranging from \$1.60 to \$1.65 for domestic lump, and an advance is predicted early in August. Splint lump is firm, and the tonnage allotted to this territory has been light. Several splint contracts have been declined because operators were sold up.

Eastern Kentucky coal of good quality has been offered freely at sacrifice prices. Millers Creek is not obtainable, as producers sold their production at attractive figures.

Anthracite shows some signs of improvement, due mostly to the fact that buyers wish to take advantage of the July discount prices. Absorption of hard coal, however, is still disappointing, and considerably behind the same period of several recent years.

Quotations in the Chicago market are as follows, per net ton f.o.b. mines:

	Williamson and Franklin Co.	Springfield	Cartersville	Clinton	Knox and Greene Cos.
Lump.....	\$1.55@1.65	\$1.50@1.60	\$1.55@1.65	\$1.50@1.60	\$1.50
Steam lump	1.35	1.30@1.35		1.45@1.50	1.35@1.45
2 1/2 and 3-in. lump.....				1.50@1.55	
1 1/2-in. lump.					
Egg.....	1.55@1.65	1.50@1.60	1.55@1.65	1.40@1.50	1.40@1.50
Nut.....	1.45@1.55	1.20@1.25		1.35@1.45	1.25@1.40
No. 1 washed	1.55@1.65		1.60@1.70		
No. 2 washed	1.50		.90@1.00		
No. 1 nut.....	1.55				
No. 2 nut.....	1.45				
Mine-run.....	1.25	1.15		1.10@1.15	1.15@1.25
Screenings.....	.95@1.00	.90@.95		.95@1.00	1.00
	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W. Va. Smok'l.	Penna. Smokeless	Hocking
Lump.....	\$1.55@1.65	\$1.50@2.10	\$1.75@2.00	\$1.60@2.00	\$1.70@1.75
1 1/2-in. lump.	1.30@1.35				1.50@1.60
Egg.....	1.55@1.65	1.35@1.60	1.75@2.00	1.60@2.00	1.50@1.70
Nut.....	1.45@1.55	1.15@1.35	1.60	1.60	
No. 1 nut.....	1.55				
No. 2 nut.....	1.45				
Mine-run.....	1.25	1.05@1.15	1.35	1.25@1.35	1.25
Screenings.....	.95@1.00	.90@.95			

Kanawha splint, \$1.50@1.60.

KANSAS CITY

Market firm with tendency to advance. Anthracite scarce.

The demand for southern Kansas lump and nut coal is still heavy because of the threshing season. The demand is also good for southern Kansas steam coals. Prices on all grades are firm with a tendency to advance.

The demand for Arkansas semi-anthracite is fair with the prices firm, as is the condition with Arkansas anthracite. The demand for Pennsylvania anthracite is good with a shortage in some grades, especially on nut and egg sizes. Shipments on these sizes are about ten days slow.

The demand for northern Missouri coal is good and the prices firm with an inclination to increase. The demand for Wyoming coal of domestic sizes is light and there is a shortage of slack coal for steam plants.

I. C. C. DECISIONS

No. 6287—Poteau Coal and Mercantile Co. vs. Abilene & Southern Railway Co. et al. Submitted Sept. 30, 1915. Decided July 7, 1916.

1. The rates from Witteville, Okla., to points in Texas and other states which had been canceled by the defendants were unreasonable in the amount that they exceeded the joint through rates formerly in effect, and reparation was awarded accordingly.

2. The Fort Smith, Poteau & Western Railway Co. is a common carrier. The question of divisions was left for further consideration.

Investigation and Suspension Docket No. 344—Coal rates from Oak Hills, Colo. Submitted Dec. 10, 1915. Decided June 28, 1916.

Original finding that the divisions accruing to the Denver & Salt Lake Railroad Co. out of joint rates on bituminous coal from Oak Hills, Colo., to destinations on the Chicago, Rock Island & Pacific Ry. should be \$1.18 per ton on all kinds of coal but nut, slack and pea coal, and \$1.12 per ton on nut, slack and pea coal, affirmed on rehearing with the modification that when the rate on nut, slack and pea coal is the same as the rate on lump coal the Denver & Salt Lake R.R. shall receive a division on nut, slack and pea coal of \$1.18 per ton.

No. 8000—Pittsburgh & Ohio Mining Co. et al. vs. Baltimore & Ohio Railroad Co. Submitted Feb. 3, 1916. Decided June 27, 1916.

Demurrage charges assessed by defendant on coal held in cars for trans-shipment at Lorain, Ohio, not shown to be unreasonable or unjustly discriminatory. Complaint dismissed.

PRODUCTION AND TRANSPORTATION STATISTICS

CHESAPEAKE & OHIO

The coal and coke traffic from the New River, Kanawha and Kentucky districts for the month of June and for the fiscal year 1916, compared with 1915, was as follows, in short tons:

	JUNE	1916	1915
Coal to:			
Tidewater.....		445,551	414,428
East.....		169,672	140,413
West.....		1,544,229	1,284,398
Total.....		2,159,452	1,839,239
Tidewater from connections.....			
Bituminous from connections.....		221,353	185,400
Anthracite local.....		7	229
Anthracite from connections.....		1,821	1,129
Grand total.....		2,382,633	2,025,997
Coke to:			
Tidewater.....			139
East.....		11,716	4,582
West.....		24,620	6,735
Total.....		36,336	11,456
From connections.....		4,015	11,245
Grand total.....		40,351	22,701

YEAR ENDING JUNE, 1916

	1916	1915
Coal to:		
Tidewater.....	5,215,719	3,882,443
East.....	2,694,037	2,352,457
West.....	16,249,235	13,627,870
Total.....	24,158,991	19,862,770
Tidewater from connections.....		187
Bituminous from connections.....	2,334,779	1,246,576
Anthracite local.....	1,564	980
Anthracite from connections.....	14,279	14,308
Grand total.....	26,509,613	21,124,821
Coke to:		
Tidewater.....	818	750
East.....	103,962	38,509
West.....	240,039	73,643
Total.....	344,819	112,902
From connections.....	125,087	88,019
Grand total.....	469,906	200,921

BRITISH COAL EXPORTS

British coal and coke exports for the half-year ending June 30 were as follows, compared with 1915:

	1915		1916	
	Tons	Value	Tons	Value
Anthracite.....	1,014,668	\$4,611,483	1,011,158	\$6,133,516
Steam.....	16,372,730	65,735,572	13,947,624	78,067,181
Gas.....	3,613,003	11,325,126	3,044,655	13,761,304
Households.....	512,445	2,112,244	232,783	1,337,803
Other sorts.....	819,744	2,591,216	839,241	3,947,773
Total.....	22,332,590	\$86,383,542	19,075,461	3,247,536
Coke.....	419,709	1,890,598	744,247	5,771,920
Total.....	23,377,174	\$88,266,234	20,504,687	\$109,018,457
Bunker coals.....	7,400,321		6,578,207	

FOREIGN MARKETS

GREAT BRITAIN

July 5—Tonnage is arriving slowly and stocks of coal are considerably heavier. Under the circumstances, sellers are disposed to make concessions for prompt loading, but not for forward loading, as they anticipate stronger conditions later. Quotations are approximately as follows:

Best Welsh steam.....	Nominal	Best Monmouthshires.....	\$10.30@10.45
Best seconds.....	Nominal	Seconds.....	9.75@10.45
Seconds.....	\$9.75@10.45	Best Cardiff smalls.....	7.00@7.25
Best dry.....	9.00@10.45	Cargo smalls.....	5.00@5.60

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The market is extremely quiet and rates are approximately as follows:

Gibraltar.....	\$8.50	Port Said.....	\$19.45
Genoa.....	16.40	Las Palmas.....	9.00
Naples.....	16.40	St. Vincent.....	9.75
Alexandria.....	20.00	River Plate.....	9.75